



Positive and smooth stops at any speed—*with any load*

● The TRU-STOP Emergency Brake stops any vehicle in a short distance—no matter what load or speed. This quick stop is made smoothly—without squealing, chattering or grabbing.

Thousands of users vouch for the economy of TRU-STOP Brakes. The ample lining surfaces wear evenly. Ventilated discs prevent overheating. It is an easy job for any mechanic to install the brakes—and for any driver to adjust and reline them.

BUY ACCO QUALITY in automotive products like *Tru-Stop Emergency Brakes, Weed American Bar-Reinforced Tire Chains, Tru-Lay Brake Controls, Tru-Level Oil Controller and Manley Garage Equipment.*

AMERICAN CABLE DIVISION AUTOMOTIVE DIVISION, DETROIT, MICHIGAN

Manufacturers of the famous Weed
American Bar-Reinforced Tire Chains



AMERICAN CHAIN & CABLE COMPANY, Inc.

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TRU-LEVEL OIL CONTROLLER

After exhaustive tests the Tru-Level Oil Controller is being adopted by car and truck manufacturers in production and is also being ordered by fleet owners for installation. It protects equipment and saves money by maintaining a proper level of oil in crank case at all times. It can't go wrong. Manufactured by American Chain & Cable Company, Inc., 12-252 General Motors Building, Detroit, Michigan.

AUTOMOTIVE INDUSTRIES

AUTOMOBILE

Reg. U. S. Pat. Off.
Published Weekly

Volume 80

Number 14

JULIAN CHASE, Directing Editor
HERBERT HOSKING, Editor
P. M. HELDT, Engineering Editor J. B. POLLOCK, Ass't Editor
JOS. GESCHELIN, Detroit Technical Editor MARCUS AINSWORTH, Statistician
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B. M. IKERT, Contributing Editor

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Week's Production Estimated 84,000

Industry "Satisfied" With Present Trend

Reacting to favorable sales reports for the last 10-day period in March, car and truck production for the week ending April 8 was expected to show an increase over the final week in March and resume the rate which had been in effect during earlier weeks of the preceding month.

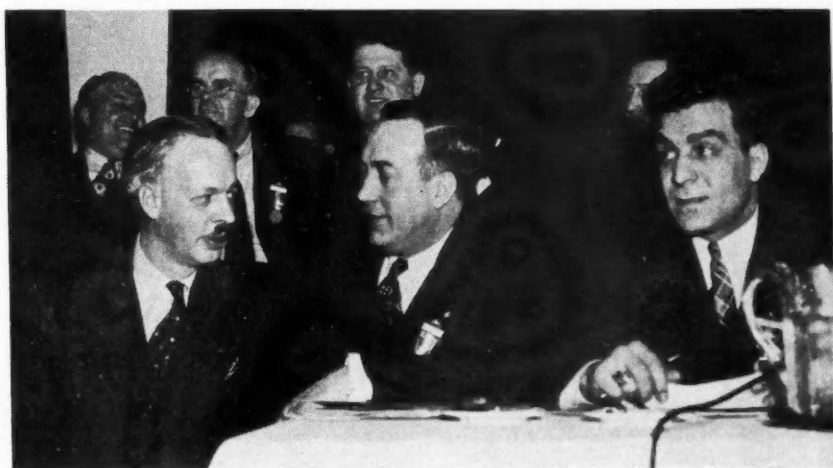
Although there was a trimming of weekly schedules in the plants of some producers, most of them continued at approximately the same rate that had been in effect while upward revisions in several other plants were enough to bring the total for the current week to approximately 84,000 vehicles.

In spite of the fact that the seasonal increase in production has not been as sharp as in some other years, there is evident an air of general satisfaction over the way things are going. It is pointed out that there was nowhere near the usual falling off during January and February and as a result a sharper upturn hardly is to be expected. Dealers are adequately, though not heavily, stocked and the production curve can be expected to follow the sales curve even more closely than it has. Used car stocks are also reported to be in good condition with inventories considerably lower than they were at this time a year ago.

Buick sales during the last 10 days of March totaled 9428 cars to establish a new peak for the season and to contribute to a record which made the first quarter of 1939 the best quarter in the history of the company with domestic deliveries totaling 46,675. Best previous quarter was the first of 1926 when 44,935 cars were sold.

Nash points to a 61 per cent sales increase during the first quarter in support of its claim to becoming the fourth largest company in the industry.

The current week's production total was bolstered by Studebaker's plans to build 2774 cars and trucks and by resumption of production by Willys Overland with 1100 units scheduled. General Motors divisions were expected to account for more than 32,000 cars and trucks, followed by Ford with slightly more than 20,000 and Chrysler divisions with more than 19,000.—J. A. L.



International

Leaders in UAW

These three men loom as leaders in the huge United Automobile Workers Union. Pictured together at the Cleveland convention, they are Richard Reisinger of Cleveland, executive member of the board, R. J. Thomas of Detroit, elected president on a compromise slate, and George Addes, who succeeds himself as secretary-treasurer. Thomas announced the membership as 371,213 as compared with an equal number a year ago.

Thomas-Addes Chosen Leaders In UAW Cleveland Convention

Meeting Votes to Work Toward A Thirty-Hour Week with 40-Hour Pay

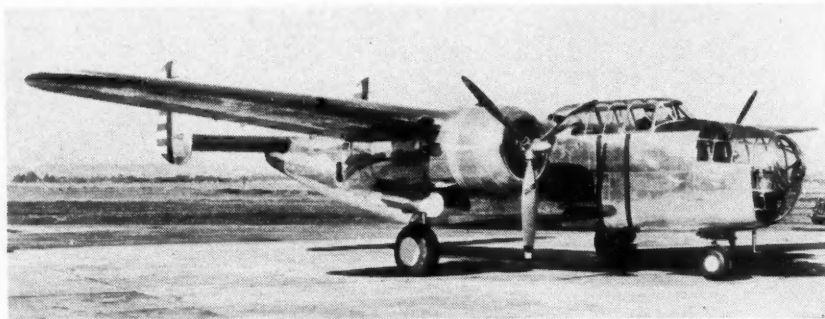
As the extended convention of the CIO section of the United Automobile Workers Union drew toward its close in Cleveland after two weeks of continuous sessions it appeared that continued skillful handling would be required of CIO leaders to hold down further outbreaks of factional difficulties within the group.

Although various contingents within the group had been united in their opposition to Homer Martin, now president of the independent UAW section, and had accepted assistance of the CIO in the struggle that has divided the union, leaders of the various contingents have not been united on other matters and most of them were ambitious to continue in key offices of the union. Elimination of the vice-presidential posts which a number of them had held, by vote of the convention on the recommendation of the CIO leaders left only positions on the executive

board available and the so-called left wing element in the union succeeded in winning a 13 to 5 majority on the board.

Leading up to this situation was the election, on a compromise slate, of R. J. Thomas as president and George F. Addes as secretary-treasurer. Thomas had been acting president of the group since the withdrawal of Homer Martin and his candidacy was openly supported by Philip Murray and Sidney Hillman, CIO vice-presidents named by John L. Lewis to keep peace within the union. Addes had been secretary-treasurer of the original UAW and had continued in that office with the CIO bloc. He also had been a presidential candidate with the support of the left wing bloc led by by Richard T. Frankenstein, one of the former vice-presidents. Frankenstein and 11 others supported by the left wing group in-

(Turn to page 453, please)



Acme

Test New Bomber

Tests are now being given this high speed, twin-engine attack bomber for the U. S. Army Air Corps at Wright Field, Dayton, Ohio. Tricycle landing gear and flush-riveted metal covering to reduce air friction are features. Said to be among the fastest of new air weapons, it was built by North American Aviation, Inc., of Inglewood, Cal.

Marine Industry Opposes Magnuson "Labor" Bill

*National Assn. of Engine & Boat Mfrs.
To Present Case at Hearing April 11*

Boat, engine, and boating accessory makers, and the motorboating public are rallying in opposition to the bill recently introduced into Congress by Representative Warren G. Magnuson, Seattle. H. R. 1809, a so-called "labor bill," would force thousands of owners of power boats of 40-odd feet and longer (15 tons) to employ licensed navigating and engineering officers, submit to annual hull inspections, and require a wide range of auxiliary equipment.

The bill will be subjected to a public hearing on April 11, in Washington, when the National Association of Engine & Boat Manufacturers will present the case against the proposed law.

In the 15-ton-and-over class are more than 5000 documented craft, i. e., boats registered by the government to carry on commerce and business, or pleasure boats which are permitted to go from one customs area to another. Several thousand other vessels of this size are afloat as pleasure craft.

In effect, a spokesman of the industry told AUTOMOTIVE INDUSTRIES this week, the Magnuson bill would be similar to requiring the hiring of a chauffeur and a footman by all owners of higher-priced cars.

Many of the documented vessels in the 15-ton class are owned by licensed navigators or engineers, and other owners of such craft ship a licensed navigator and engineer. But the bill, if enacted into a law, would force thousands of boats out of service, and would effectively block the sale of new craft of this size, according to Ira Hand, secretary of the National Association of Engine & Boat Manufacturers.

At a recent conference, Admiral R. R. Waesche, commandant of the U. S. Coast Guard, decried the tendency of

legislators to attempt to solve all problems by enacting new laws.

"I am thoroughly convinced," he said, "that the fewer the laws and regulations and the more intelligent the enforcement and administration of present laws, the further we will get along toward the proper regulation of boats.

"I feel that the answer to most of our problems lies not in more restrictive laws, but in less restrictive laws, and more intelligent and closer cooperation between the motorboat agencies and motorboat owners."

He pointed out that safety equipment requirements, for example, on boats in the Mississippi River and at the mouth of the Columbia River are entirely different.

He said that many of the troubles that befall boat owners on the high seas are the result of carelessness in keeping the vessel in good condition, or the lack of proper equipment, or mismanagement, but he felt that the Coast Guard has gone far in improving the situation.

Several bills pending in Congress have the approval of the association, Mr. Hand said.

The Magnuson bill is seen as a first step to force owners of pleasure craft and work boats to employ enough licensed personnel to be on duty on the bridge and in the engine room at all times, several spokesmen of the engine and boat building industries told AUTOMOTIVE INDUSTRIES.

Edward Gray

Edward Gray, former chief engineer of the Ford Motor Co., died in Detroit on April 2. Mr. Gray designed and installed the first large internal combus-

tion engine in the Ford company's old Highland Park plant. For the last three years he devoted his time to designing a combination steam-Diesel locomotive which he believed would revolutionize rail transportation.

Retail Sales Well Over '38

*Report Increases in
Early March Sales*

Announcements by various automobile manufacturers indicate retail sales continuing well in advance of the volume set in 1938. Chevrolet dealers sold 24,342 new cars and trucks at retail during the second 10 days of March, it was announced at company headquarters. This is a continuation of the upward trend notable since new model introduction, making the month's sales to date 36.3 per cent higher than they were a year ago. Combined sales of new cars and used cars, during the second 10 days, were 66,295 units, and for the month to date, 126,373, the announcement said.

Domestic retail deliveries of Buick motor cars during the first 20 days of March totaled 11,531 units, a gain of 3988 or 53 per cent over February, and 3304 or 40 per cent over the corresponding period a year ago, according to figures released by W. F. Hufstader, general sales manager.

Mr. Hufstader said that sales of 5943 units during the second 10 days of the month exceeded those of the strong first period by 355 units and were 2317 greater than a month ago.

Oldsmobile national retail sales continued strong during the second 10-day period of March with a total of 3999 new car deliveries, an increase of 39.2 per cent over the 2872 sales recorded in the same period of 1938, according to a report issued by D. E. Ralston, general sales manager.

Sales from Jan. 1 through March 20 aggregated 26,680 units, an increase of 52 per cent over the 17,549 sales made during the like period of last year. An increase in retail volume has been noted in every 10-day sales period compared with last year, since the introduction of the 1939 Oldsmobile line last October.

Nash's retail sales of new cars during the second 10 days of March were up 84.3 per cent over the same period last year, it was announced by W. A. Blees, general sales manager. Sales during the period totaled 1806 units, as compared with 980 units in the same period of 1938, and were highest for any 10-day period since fall of 1937.

The total represented an increase of 14.2 per cent over the first 10 days of the month, when 1582 units were delivered by Nash dealers, and an increase of 47 per cent over the last 10 days of February, Blees said. Deliveries in the first 20 days of March totaled

3388 as compared with 2132 units during the first 20 days of February, an increase of 58.9 per cent.

Bantam sales for the first quarter of 1939 showed a 58 per cent increase over the three preceding months in 1938 according to Francis H. Fenn, vice-president and general manager, of the American Bantam Car Co. "Total sales for March showed a 22 per cent increase over February figures in spite of a drop in export sales caused by unsettled conditions abroad. Based on past experience, we expect the next quarter to show an even greater gain."

Aircraft Plants Plan Expansion

Plans for expansion of facilities later this year by the Ryan Aeronautical Co., and Solar Aircraft Co., the two largest plane accessory manufacturers, whose plants are located in San Diego, Cal., will enable these units to speed up operations to handle the increased business for exhaust manifolds and other aircraft parts now on the books. Solar has just let contract for construction of a plant addition which will double floor area and plant capacity.

Ryan's plans call for a new factory building to be constructed at Lindbergh Field, adjacent to the Coast Guard Base. Entire manufacturing facilities will be transferred to the new building, and present facilities will be used for school purposes. The San Diego Harbor Commission is reported to favorably considering granting Ryan a long term lease on ten acres of airport to make possible expected additions to the new factory.

Twin Coach Buses For World's Fair

Twin Coach Co., of Kent, Ohio, has received an order for 120 new buses to be operated in the World's Fair area in New York City, officials announce. The buses will carry 40 passengers each and will be operated by the North Shore Bus Co. of Queens Borough. The order for \$1,300,000 swells the Twin Coach bookings to more than \$2,250,000 and officials say this will insure steady employment for the firm's more than 600 employes through July. Total orders now on the books call for 246 buses.

Harry Lucas

Harry Lucas, for many years chairman and managing director of the firm of Joseph Lucas Ltd., Birmingham, England, and one of the pioneers of the British automotive-electrical-equipment industry, died on March 12. He was 84 years old. The firm which he headed was founded by his father and originally built ships' lamps, photographic lamps, etc. Later the manufacture of bicycle lamps was taken up, and with the advent of the automobile, the manufacture of auto lamps and other automobile accessories.

Germany Orders Limitation Of Passenger Car Models

**Number of Models Cut from 54 to 30
In Scheme to Be Effective Next Year**

A definite scheme of rationalization or limitation of models in production worked out for the German motor vehicle industry has been issued by Motor-Vehicle Commissioner von Schell and will go into effect on Jan. 1, 1940. Provision is made for plants in the former Austria and the Sudeten area. From a total of 54 models now in production by German manufacturers, the number has been cut down to 30. Passenger car models are divided into five classes according to piston displacement, and each manufacturer has his model or models allotted to him, as shown by the accompanying table (see p. 476). After Jan. 1, 1940, cars not conforming to the new order will not be registered in Germany.

The new line-up naturally involves many changes in production program. Thus the Ford 71-cu. in. model will disappear. Two German cars in the second displacement classification, the BMW and Borgward, will disappear, although the BMW has been a very popular model. There is no Ford car now in production here that comes within the second displacement class, and as one is listed it must mean either that a new model is under development or that the model in the lowest-displacement class is to be provided with a larger engine.

By far the largest class is that of displacements up to 183 cu. in., one model in this class being allotted to each of the eleven firms producing passenger cars in Germany. The reason seems to be that the higher traveling speeds permitted by the new super highways have led to a demand for higher

powers. Ford now has no model in this class in production in Germany, and it appears that the present V-8 of 220 cu. in. displacement will be replaced by the lower-displacement "60" now in production in Great Britain.

Considerable changes will be made also in the truck industry. In the future there will be only one 1-ton truck, and that will be the Borgward. Trucks of 1½ tons capacity will be built by five makers, namely, Borgward, Daimler-Benz, Opel, Phaenomen and Steyr. The first two firms mentioned will equip their trucks with either a diesel or a carburetor engine, at the option of the purchaser. In the case of the Opel the commissioner has reserved the right to limit its annual output of this size of truck. Trucks with

(Turn to page 476, please)

Canadian Car Sales Down in February

Sales in Canada of new motor vehicles in February declined, totaling 5,688 units, retailing for \$6,319,722 compared with 5,930 at \$6,616,269 in January, and 7,061 for \$7,838,874 in February, 1938.

Decreases of 12 per cent in number and 18 per cent in amount were recorded for the two months' totals as compared with corresponding totals for 1938. Motor vehicle financing totaled 13,096 units at \$5,575,496 in the first two months of 1939, while 14,841 transactions involving \$6,764,672 took place in the same two months of 1938.

Wet Nurse

This odd craft was recently designed and built at Bilston, Staffordshire, England. Its body filled with gasoline and oil, its purpose is to rush over rough ground at airports refueling air liners.



AUTOMOTIVE INDUSTRIES

Summary of Automotive Production Activity (Week Ending April 8)

BUSES Little change in general activity. One large producer reports slackening in output regarded, however, as only a "temporary adjustment." Another manufacturer reports large order for New York's World's Fair (see p. 451, this issue).

TRUCKS Trend continues to be regarded as "good." One producer states accumulation of orders is more than seasonal. Another maker is contemplating introduction of a new model, but is waiting for dealers to deplete present stock of larger models.

TRACTORS Apparently fine condition of winter wheat in the "plains" states, with possible exception of some portions of Okla. and Neb., giving impetus to buying.

AUTOMOBILES AUTOMOTIVE INDUSTRIES' mid-week survey of production schedules sets estimated output for the current week at 84,000 cars and trucks. Production curve may be expected to follow sales curve more closely than it has in recent weeks.

MARINE ENGINES Sales considered only "fair" but outlook is considered bright. Industry's attention focussed on public hearing of Magnuson Bill (see news story p. 450).

AIRCRAFT ENGINES Production continues at high rate, with every prospect of increased schedules to supply Army, Navy and export requirements.

This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.

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Men

The Aeronautical Chamber of Commerce of America, Inc., announces the appointment of **Irving H. Taylor** as manager of the export department of the Chamber. Mr. Taylor was formerly chief, Automotive-Aeronautics Trade division, Bureau of Foreign and Domestic Commerce, Department of Commerce.

Lloyd R. Earl has been elected a vice-president of the Consolidated Steel Corp. He has been production manager for a number of years.

L. W. Ward, manager of the Port-

land zone for Pontiac, has been transferred to the same position in the larger Cleveland zone. He succeeds **G. B. Abrecht**, resigned. Mr. Ward is succeeded in Portland by **J. S. Bathrick**.

P. N. Jansen, factory manager for Curtiss Aeroplane division of Curtiss-Wright Corp., has returned to Buffalo, N. Y., from the west coast where he has been studying plant methods in the Douglas, North American and Lockheed factories.

A. T. Colwell, a vice-president of Thompson Products, Inc., and **J. D. Wright**, secretary, were elected directors of the company at its recent board meeting.

All directors and officers of the

Motor Wheel Corp. were reelected at the annual meeting of the stockholders.

Inland Steel Co. has announced the appointments of **Ervin J. Sanne** as assistant manager of sales of the sheet and strip steel division of the sales department; **Frederick A. Ernst** as district sales manager at St. Paul; and **Harry A. Johnson** as assistant to Mr. Ernst. The appointments of Messrs. Sanne and Ernst become effective May 1; the appointment of Mr. Johnson is effective at once.

J. Earl Simonds, well known in the plastics industry, has opened an office as plastics consultant at 5 DeForest Ave., Summit, N. J. Mr. Simonds will offer a complete service on plastics exclusively, including plant layout and equipment, materials, markets.

The Pyle-National Co. has secured an exclusive license from Burgess Battery Co. for the engineering, manufacture, and sale of the Multi-vent system of draftless ventilation for application to transportation equipment. **Edward A. Sipp** has rejoined The Pyle-National Co. as vice-president in charge of the Multi-vent division. During the past three years Mr. Sipp has been responsible for engineering and development work in connection with the Multi-vent system.

Byron A. Fay, vice-president in charge of operations of Electric Auto-Lite Co., was named a director at the company's annual meeting. Officers will be named later.

Fairchild Corp. Income Report

Fairchild Aviation Corp. and subsidiaries report for the year ended Dec. 31, 1938, net income of \$322,473. For 1937, the company reported net of \$139,674. Unfilled orders as of Dec. 31, 1938, were \$1,070,338.

New Passenger Car Registrations

	FEBRUARY	JANUARY	FEBRUARY	TWO MONTHS		Per Cent Change, 2 Months, 1939 over 1938	Per Cent of Total Two Months		FOUR MONTHS MODEL YEAR		
	1939	1938	1938	1939	1938		1939	1938	1939	1938	Per Cent Change
Chevrolet	38,544	46,471	29,678	85,015	64,065	+ 33.0	23.09	24.07	188,999	169,480	+ 11.7
Ford	30,773	37,541	27,761	68,314	64,041	+ 6.7	18.56	24.06	134,900	111,411	+ 21.0
Plymouth	23,956	29,960	14,508	53,916	32,061	+ 68.3	14.64	12.05	121,208	81,740	+ 48.5
Buick	12,921	15,838	9,239	28,759	20,531	+ 40.1	7.81	7.71	66,590	54,339	+ 22.8
Dodge	12,401	15,587	6,670	27,988	14,540	+ 92.4	7.60	5.46	56,057	40,151	+ 40.0
Pontiac	9,369	11,505	6,159	20,674	13,398	+ 56.0	5.67	5.03	46,614	36,285	+ 28.5
Oldsmobile	8,750	11,419	5,843	20,169	12,607	+ 60.0	5.48	4.74	45,572	32,756	+ 39.1
Chrysler	4,632	5,877	3,132	10,509	7,025	+ 49.8	2.85	2.64	21,306	19,388	+ 10.0
Mercury	3,538	4,510		8,048			2.19		14,883		
Nash	3,308	3,900	2,125	7,208	4,945	+ 45.8	1.96	1.86	12,812	12,291	+ 4.3
De Soto	3,190	3,952	2,245	7,142	5,098	+ 40.0	1.94	1.92	15,227	14,281	+ 6.5
Hudson	3,032	3,560	2,886	6,592	5,795	+ 14.0	1.79	2.18	15,999	15,064	+ 6.2
Studebaker	3,011	3,500	2,380	6,511	5,075	+ 28.5	1.77	1.91	15,979	12,776	+ 25.3
Packard	2,664	3,068	3,254	5,752	6,728	- 14.5	1.56	2.53	14,819	17,537	- 15.6
Lincoln	1,379	1,938	1,266	3,317	3,008	+ 10.4	.90	1.13	6,679	6,448	+ 3.8
La Salle	1,308	1,794	811	3,102	1,891	+ 64.0	.84	.71	7,706	5,330	+ 44.5
Cadillac	918	1,262	808	2,200	1,616	+ 36.2	.60	.61	4,856	2,873	+ 69.0
Willis-Overland	747	976	1,047	1,725	2,416	- 28.5	.47	.91	3,647	6,869	- 46.8
Graham	277	350	368	627	914	- 31.3	.17	.34	1,341	2,274	- 41.0
Bantam	54	64		118			.03		225		
Hupmobile	36	61	73	97	155	- 37.4	.03	.06	198	261	- 24.1
Fiat	16	15		31			.01		72		
Miscellaneous	118	22	104	140	215	- 34.9	.04	.08	291	661	- 56.0
Total	164,942	203,212	120,359	368,150	266,124	+ 38.2	100.00	100.00	795,980	642,215	+ 23.8
Chrysler Corp.	44,179	55,376	28,555	99,555	58,724	+ 69.7	37.04	22.07	213,798	155,560	+ 37.1
Ford Motor Co.	35,690	43,989	29,029	79,679	67,049	+ 19.0	21.65	25.19	156,462	117,859	+ 33.0
General Motors	71,810	88,309	52,538	160,111	114,108	+ 40.3	43.49	42.88	360,337	301,063	+ 19.6
All Others	13,263	15,538	12,237	28,801	26,243	+ 10.0	7.82	9.86	65,383	67,733	- 3.5

Early Report Expected in FTC Factory-Dealer Investigation

*Ourselves and Government—A Check List
Of Federal Action Corrected to April 6*

Federal Trade Commission

The Federal Trade Commission was expected to report to Congress next week on the results of its \$50,000 investigation of the manufacturer-dealer relations in the automobile industry.

While April 13 has been tentatively set as the date for transmitting the report to Congress, Commission officials were reluctant to set any specific date, pointing out that it may be sent later in the week or possibly held over until the following week.

Since Congress authorized the investigation a year ago, the FTC has persistently declined to discuss the inquiry, although it has conceded from time to time that an investigation was under way. An expenditure of \$50,000 was authorized for the inquiry but Congress never appropriated funds for the purpose. The Commission was forced to obtain its money from funds already appropriated.

The resolution was sponsored in the House by Congressman Gardner R. Withrow, Progressive of Wisconsin, who was defeated for reelection by Harry Wilbur Griswold, a Republican.

GENERAL MOTORS EXCLUSIVE DEALER CASE. Hearings have been

tentatively scheduled for April 12 in Philadelphia and April 17 in Chicago. The most recent sessions ended in Boston on March 1. Case involves the FTC allegation that GM dealers are required to handle GM parts exclusively.

F.O.B. PRICE CASE. Hearings resumed in Washington on Wednesday covering the GM part of the case. The last GM hearings started in Detroit on March 7. A similar case, involving the FTC allegation that price advertising is misleading, is pending against the Ford Motor Co.

SIX PER CENT CASE. Brief from GM was due to be filed April 5 after FTC had extended the deadline. The Commission, which also has a similar case pending against Ford, charges the companies engaged in false and misleading representations in finance plan advertising.

UAW Leaders

(Continued from page 449)

cluding the reported support of the Communist party, won election to the

executive board to give this element, with Addes, a 13 to 5 voting majority over the more conservative representatives led by Thomas the new union president.

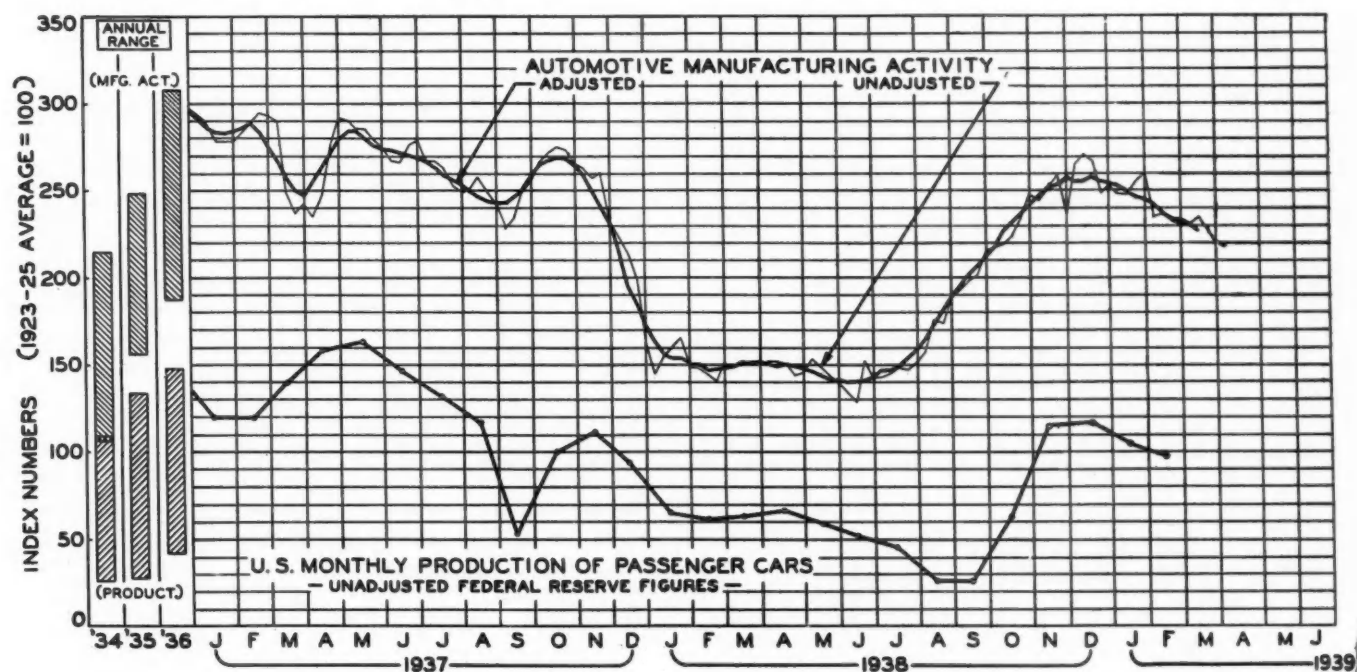
That the good offices of the CIO would continue to be needed in keeping the union's affairs on an even keel was seen in the recommendation that the coordinating committee, named when the original factional dispute arose, be continued. Serving on the coordinating committee, which would be empowered to advise the UAW executive board, would be Murray and Hillman, from the CIO, and Thomas and Addes, president and secretary-treasurer.

The convention also voted to work toward the objective of a 30-hr. week with 40 hr.'s pay at prevailing rates in future contract negotiations and an elaborate 15 point program to organize plants of the Ford Motor Co. also was adopted.

To promote the Ford organizational drive establishment of special research and publicity divisions were proposed as well as special drives among colored and foreign language groups. During the drive initiation fees are to be cut from \$2 to \$1 and present Ford workers, in the membership, delinquent in dues payments would be absolved from reinstatement payments.

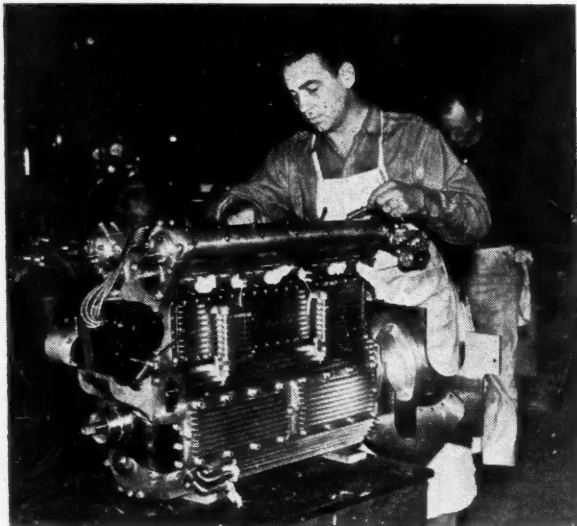
Continued organization activity among WPA workers also is proposed on the theory that when and if these workers return to automotive jobs they already will be union members.

Automotive Activity Index Continues Downward Move



Rounding out four weeks of consistent downward movement, the unadjusted index of automotive manufacturing fell to 219 for the week ending April 1. This

mark was two points below that of the preceding week. The continued down trend is reflected in the adjusted index, which dropped two points to 228.



soilbelman

Preparation

Comes the spring and race car builders start their mechanical primping for the Indianapolis classic. Here Art Sparks, millionaire builder and driver of fast mounts, inspects a six-cylinder engine built under his supervision.

General Business Level Declines; Commodity Price Index Unchanged

*An Exclusive and Regular Weekly Feature
Written by the Guaranty Trust Co., N. Y.*

General uncertainties were reflected in receding levels of business activity last week. The index of the *Journal of Commerce* declined to 85.8 for the week ended March 25, as compared with 86.3 for the preceding week and 71.6 a year ago.

A substantial expansion of retail trade last week was reported, indicative of the usual pre-Easter stimulus. Department store sales in the week ended March 25, as reported by the Board of Governors of the Federal Reserve System, were 2 per cent larger than a year ago, as compared with a similar gain of 5 per cent for the week before.

Railway freight loadings increased further in the week ended March 25, totaling 605,462 cars, as compared with 594,568 cars in the preceding week and 572,952 cars a year ago.

The output of electricity by the power and light industry during the week ended March 25 was 11.3 per cent above the corresponding production last year; the similar gain for the preceding week was 10.3 per cent.

Production of crude oil during the week ended March 25 averaged 3,382,350 barrels daily, as compared with 3,384,150 barrels for the preceding week and 3,405,600 barrels in the corresponding period last year. Production requirements for March, as computed by the Bureau of Mines, amounted to 3,340,000 barrels daily.

Average daily production of bituminous coal during the week ended March 25 was 1,255,000 tons, as against 1,278,000 tons for the preceding week and 897,000 tons in the like period a year ago.

Engineering construction awards during the week ended March 30 totaled

\$59,044,000, according to *Engineering News-Record*, bringing the total for thirteen weeks this year to \$801,102,000, or 22.4 per cent more than the corresponding total last year.

Increased cotton-mill activity during the week ended March 25 was reflected in the advance of the *New York Times* index to 121.8, as compared with 120.0 for the week before and 89.7 for the corresponding period last year.

Professor Fisher's index of wholesale commodity prices remained unchanged last week at 79.8. The average of 80.0 for the month of March compares with 82.2 for the like period last year.

Reserves of member banks of the Federal Reserve system increased \$135,679,000 during the week ended March 29. Estimated excess reserves rose \$160,000,000 to a total of \$3,520,000,000.

G.M.-Cornell World Price Index

The General Motors-Cornell World Price Index of 40 basic commodities for the week ended March 25 was 60.8, compared with the previous week's figure of 60.9 (revised). The United States index in gold decreased 0.2 point.

States Inactive In Wage-Hour Legislation

Administration efforts to encourage states to enact wage and hour legislation, which were intensified last November when Secretary of Labor Perkins distributed copies of a model draft patterned after the Federal wage and hour law to representatives of state labor departments assembled in Washington, have accomplished little, a check up showed this week.

Returns filed with the Labor Department's Law Information Division showed that, although five states—California, Montana, Oregon, South Carolina and Vermont—passed so-called enabling legislation designed to permit state cooperation in securing enforcement of the Fair Labor Standards Act, no state has given its approval to a wage and hour bill patterned after the Federal law. Such bills were introduced in about 26 state legislatures and nine of these already have adjourned for this session. In most of the other states the bills have been killed or pigeon-holed in committee.

Publications

A bulletin by Joseph T. Ryerson & Son, Inc., describes new lead-bearing open hearth steels which are said to improve machinability from 20 to 40 per cent. The bulletin includes results of machining tests.*

Bulletin No. 12-T by Severance Tool Mfg. Co. describes various cutters for burring, reaming or facing tubing.*

Gilman Engineering Works has published a bulletin on its "4 in 1 Tool Room Machine" which is designed to work as a precision lathe, sensitive drill, horizontal mill and vertical mill.*

Worthington Pump and Machinery Corp. has released two bulletins. One describes Worthington Monobloc Centrifugal Pumps; the other, Worthington vertical four-cycle Diesel engines.*

A folder by Anaconda Wire and Cable Co. describes ANW moisture resistant cable.*

Publication is announced of the 32nd annual edition of *Metal Statistics*, containing information on ferrous and non-ferrous metals and miscellaneous economic subjects.*

A new catalog featuring its complete line of safety lighting and reflecting equipment is being released by Do-Ray Lamp Co.*

An eight page booklet by the American Foundry Equipment Co. describes the American "Rapid" core machine.*

Practical jobs for Diesel electric generator sets of from 20 to 80 Kilowatt capacity are described in a new booklet issued by Caterpillar Tractor Co.*

First issue of *Steel Horizons*, a new house publication of the Allegheny-Ludlum Steel Corp. has been issued. Publication will be six times a year.*

The *Motorist's Handbook and Buyer's Guide*, a sequel to the "Proving Ground of Public Opinion" has been published by the General Motors Corp.*

A four-page folder by the Dure Metal Products Co. describes the company's tension indicator.*

Breuer Electric Mfg. Co. has released a folder describing its Tornado portable electric blower and the Tornado vacuum cleaner for use in industrial plants.*

Independent Pneumatic Tool Co. has released three folders describing its Thor one-half and one-quarter inch electric drills, and its Thor screw driver bits, socket wrenches and socket wrench shanks.*

* Obtainable from editorial department, AUTOMOTIVE INDUSTRIES. Address Chestnut and 56th Sts., Philadelphia.

Bulwark

"Wipe out the independent automotive wholesaler, if that were possible, and no longer could individual transportation continue in America as it now exists. Manufacturers by the hundreds would have to close shop or revert to the status of combination local producers and distributors. Thousands upon thousands of retailers would disappear. For the wholesaler serves both manufacturers and retailers in ways that they cannot serve themselves. Further, he is a bulwark against threatened monopolization of distribution in this and other industries."—Thus said B. W. Ruark, general manager, Motor and Equipment Wholesalers Association, in a recent talk before automotive retailers in Boston, Mass.

Canadian Rubber Goods Sales Decline in 1938

Sales of Canadian-made rubber goods declined last year about 10 to 15 per cent under figures for 1937.

The principal decline in articles of manufacture in 1938 was in rubber tires and inner tubes occasioned by a decline in automotive production and thus in need for original equipment tires. Production of pneumatic casings in 1938 was 2,298,529 compared with 2,676,953 in 1937, a 14 per cent decline. Decline in general business activity in 1938 was reflected in the lower production of mechanical rubber goods.

Imports of crude rubber amounted to 57,576,293 lb. in 1938 and to 81,008,666 lb. in 1937. Ninety per cent of all crude rubber came from British Empire countries and was delivered to Canadian ports.

White Motor Co. Reports '38 Loss

Annual report to stockholders by the White Motor Co. for the year 1938 indicated a net loss of \$1,825,274.95. Net sales by the company for the year were reported as \$19,393,219.32.

U. S. New Passenger Car Registrations and Estimated Dollar Volume by Retail Price Classes*

January, 1939

	Units	Per Cent of Total	Dollar Volume	Per Cent of Total
Chevrolet, Ford and Plymouth.....	113,972	58.10	\$83,400,000	48.15
Others under \$1000.....	69,020	33.97	63,700,000	36.78
\$1,001 to \$1,500.....	17,811	8.77	21,200,000	12.24
\$1,501 to \$2,000.....	1,119	.55	1,800,000	1.04
\$2,001 to \$3,000.....	1,165	.57	2,700,000	1.56
\$3,001 and over.....	88	.04	400,000	.23
Total.....	203,175	100.00	\$173,200,000	100.00
Miscellaneous.....	37			
Total.....	203,212			

* All calculations are based on delivered price at factory of the five-passenger, four-door sedan, in conjunction with actual new registrations of each model. The total dollar volumes are then consolidated by price classes.

Factory-Dealer Relations to Be Discussed at NADA Convention

W. E. Holler to Be Guest Speaker
At 22nd Annual Meeting of Group

The forthcoming 22nd annual convention of the National Automobile Dealers Association which will be held in San Francisco, April 17-20, promises to be one of the most constructive meetings in the history of this organization, according to Walter E. Blanchard, acting general manager. "Conditions surrounding automobile selling are more serious today than ever before and automobile retailers are deeply concerned over the chaotic conditions that have developed in the distribution of motor vehicles," Mr. Blanchard declared. "At this convention, it is proposed to hold a 'clinic' at which the undesirable trade practices prevalent within the industry will be thoroughly aired and remedies sought for their correction. Common practices, such as 'price-cutting', 'wild-trading'—that is, the practice of granting excessive trade-in allowances on automobiles taken in trade; the abuse of 'finance packs' whereby the public is overcharged for its automobiles — factory practices which are considered responsible for the existence of these abuses, such as overloading dealers with automobiles; the appointment of too many retail outlets in given communities; the open territory policies which invite destructive competition between dealers; activities of sales finance companies which finance time payment sales, and numerous other procedures, will be topics of discussion."

Mr. Blanchard stated that many of these practices are engaged in by only a small minority of unethical dealers, whose competitive activities seriously endanger the large majority of stable, high-grade, financially sound automobile merchants who are striving to give the public fair treatment and render adequate service at a reasonable cost.

"The entire convention program will be handled by successful retail automobile dealers selected for their knowledge and experience in connection with the

problems of automobile merchandising," Mr. Blanchard said. "The only exception will be Mr. William E. Holler, general sales manager, Chevrolet Motor division of General Motors Corp., who will be the guest speaker at the association's annual banquet which will be held in the Palace Hotel, Wednesday, April 19. Mr. Holler's topic will be 'My Conception of a Quality Dealer.' All regular sessions will be held in the St. Francis Hotel.

"Automobile retailers, of whom there are 41,592 in the United States," Mr. Blanchard said, "constitute the second largest retailing trade group, with an average annual sales volume approximating five billion dollars. On this huge volume, trade surveys show that in 1938 the average dealer received less than one cent out of each dollar as his profit compensation. The necessity for maintaining this mammoth business on a stable, sound basis is evident."

Alvon Day

Alvon N. Day, 53, West Coast manager of truck tire sales for the Good-year Tire & Rubber Co., who contracted pneumonia when he came to Akron in February for the company's home coming celebration, died April 2 at the Akron City Hospital. He formerly was with Firestone Tire & Rubber Co. and the Overman Cushion Tire Co., joining Goodyear in 1927.

40 Years Ago

With the rapidly increasing demand for motor vehicles comes the question of competent men to handle them. While the motor vehicle is in no sense a complicated machine, nor difficult to manage, yet it is new, and for this reason alone practice is required to handle it with ease and dexterity. Unfortunately, few in this country are able to get this practice, owing to the small number of vehicles extant, and the lack of schools where special instruction in the management of vehicles may be obtained.

Manufacturers who are now preparing to engage extensively in this line should consider the advisability of making such training schools adjuncts of their business. The advertisement gained by a policy so progressive would be of no small value at this time, and the advantage of selling vehicles to skilled operators instead of novices would be of still greater moment.—From *The Horseless Age*, April, 1899.

Men and Machines

Grinding Is Not

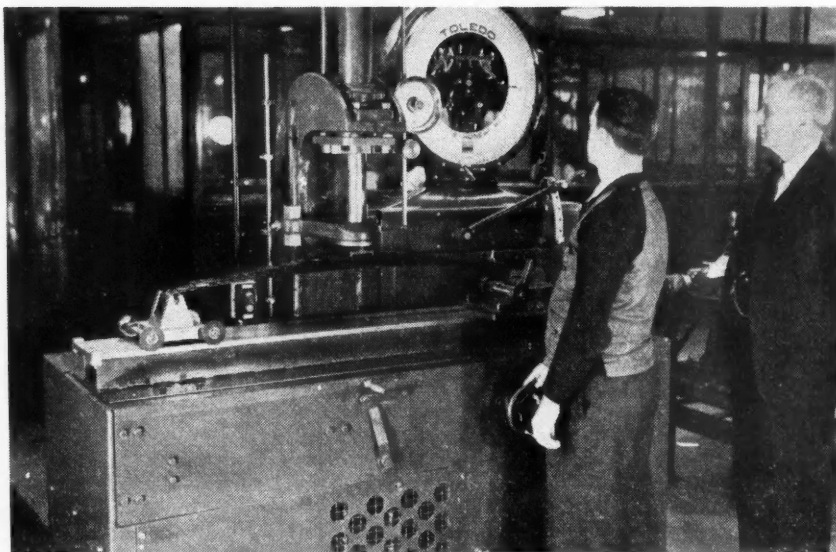
By H. E. BLANK, JR.

Grinding as a method of removing stock and obtaining a surface finish was ably discussed and compared with other available methods in a paper presented several weeks ago in Detroit by Ira J. Snader, chief engineer of the Ex-Cell-O Corp. Because, as Mr. Snader remarked, men in the machine tool and related industries "are today finish conscious to a degree that has not heretofore been known," we wish to report briefly what he had to say about the subject.

For a good many years the grinding machine was recognized as the only standard machine tool suitable for removing an appreciable amount of stock from a piece of work and at the same time producing the required accuracy and acceptable surface finish. Up until 1930 the preeminence of grinding appears to have been unchallenged. In that year, however, Ex-Cell-O introduced the first diamond boring machine especially built for finish machining non-ferrous materials with diamond tools. Subsequently the field of application for this machine was broadened by the use of carbide tipped tools to include non-ferrous materials of greater hardness. Since the adoption of the carbide tipped tools the machines have been known as precision boring and precision facing machines.

Two metal working methods, grinding and precision boring, are used today almost entirely for correcting previous machining operations and heat treat distortions, and for establishing accurate size, dimension and form on the work. Other methods of finishing, such as honing, lapping, and super finishing, are not adapted to removing a substantial amount of stock. To a great degree the other methods must depend on the ground or precision finished surface to obtain the required size and form such as roundness and straightness. Therefore, in the opinion of Mr. Snader, grinding will not pass out of the picture as an obsolete operation, its use will—in fact—become more extensive with the further development of these supplemental finishing methods.

The choice as to the method or methods to be used in finishing any particular part must depend upon the requirements of the finished surface, and the accuracy of dimension desired to provide for interchangeability of mating parts. Especially to be considered, is how high a degree of finishing consisting of smoothness as well as flatness is required on the part. In recent



Compression device manufactured by the Toledo Scale Co. and recently installed in the laboratory of the Chevrolet Gear & Axle Co. The equipment is being used to obtain data on leaf springs and coil springs.

years devices have been placed on the market for supplementing the microscope and the measuring micrometer for checking or measuring the surface finish. As pointed out by Mr. Snader, parts produced by the different methods of finishing may have identical measurements with some of these devices but they may vary considerably in appearance. He said, "The bright and highly reflective surface finish regardless of the manner in which it is produced is not necessarily in all instances the most accurate with respect to surface flatness or dimension."

Grinding, simply defined, is a method of removing material from a piece of work by means of a grinding wheel. The wheel in most instances revolves at a relatively high rate of surface speed with respect to the speed of the work which traverses past the wheel. The grinding wheel has a rather small area of contact with the work, and in this respect grinding differs from other abrasive finishing operations. To quote Mr. Snader, "In honing or lapping the abrasive element has in comparison a much greater area of contact. The scratches produced are of much greater length than those produced in grinding and cross each other in places. In grinding the abrasive element or wheel makes only a line contact in engaging the work. The rapidly revolving wheel causes the small grain particles of the wheel to remove minute chips from the

work. This results in producing a finish with the characteristic appearance of microscopic parallel scratches adjoining each other throughout the ground surface. The scratches are rather short. Their length is variable by altering the relationship of the work speed with the wheel speed. The size and depth of these scratches and consequently the appearance of the finish ground surface can be varied considerably by selection of grinding wheels having different grain size or bonding material.

"With conditions as they should be, on any of the present modern grinding machines, equipped with proper abrasive wheels, it is truly remarkable what may be accomplished in accuracy and finish. However, just as the selection of an automobile today is quite difficult—because they are all good cars today—likewise, the selection of the proper method of securing a suitable surface finish is also difficult. In the final analysis, in both instances, it depends to a great extent upon what you want to do with it after it is acquired."

While there has been nothing new in the way of grinding equipment brought to the attention of *Men and Machines* this week, we sifted through a sizable bundle of new product announcements and have selected five for description here.

A spot welder built around an entirely new design of welding head em-

on the Way Out

Use of Grinding Machines in Achieving Fine Finish Will Become More Extensive with the Further Development of Honing, Lapping and Super Finish, Says Ex-Cell-O's Chief Engineer

ploying a sliding contact has been announced by Progressive Welder Co., Detroit. The design, which has been subjected to all types of field tests during the past year, permits the elimination of flexible connections in favor of solid arms, the interchangeable use of air-hydraulic or pneumatic boosters for pressure application, a reduction in current consumption, a widened range of uses due to the more accurate pressure control, use of guns individually or in multiple—mounted vertically, horizontally, or at angles, interchangeable use of 75 to 150 KVA and larger transformers.

Coils that weigh up to 3000 lb. and measure from 1 in. to 8 in. wide can be handled on the coil cradle reel just announced by the F. J. Littell Machine Co., Chicago. The equipment is driven by a 2 hp. motor through a three to one variable speed drive and worm reducer.

For handling thin stock about 0.015

in. thick, the reel is equipped with idling slide-guide discs mounted on ball bearings to enable these to rotate with the coil and thus prevent the curling of edges. For heavy stock up to 1/4 in. thick, the cradle is equipped with a hand straightener device for easy starting of the front end of the coil into the power-driven straightener and roll feed.

A compression device recently installed in the laboratory of the Chevrolet Gear & Axle Co. is being used to obtain vital compression data on such parts as leaf springs and coil springs. The machine is a hydraulically operated ram which can be operated to compress the spring to any desired height. The record of what is taking place is registered on a scale dial which will record up to 6500 lb.

While this device has been largely used for compiling data on springs, it has also been employed to determine the compression strengths of other

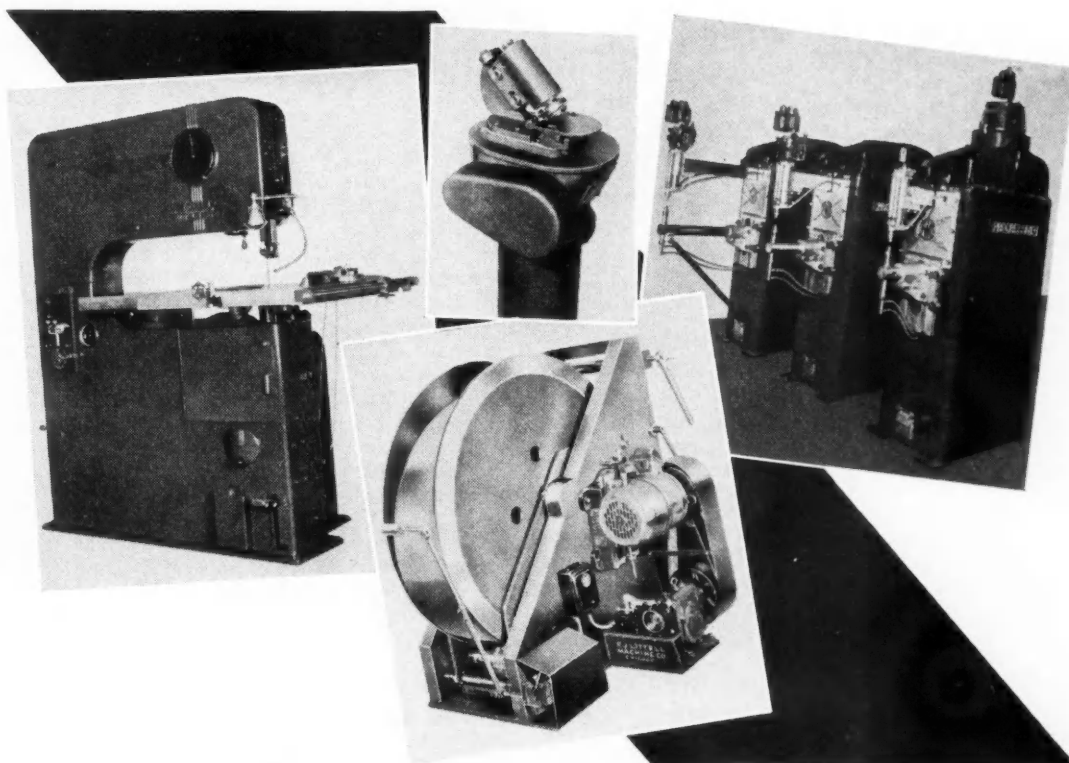
things, among which have been hexagonal nuts and rubber parts. Specifically, the machine can be utilized successfully in tests ranging from 10 lb. to 6500 lb. One small lever and a hand wheel control operation. Toledo Scale Co. manufactures the equipment.

Quickwork Co.'s new combination throatless shear and flanger is a compact, versatile unit that will handle a wide range of sheet metal fabrication. As a shear, it handles all straight and irregular cutting, including full circles and curves, both concave and convex. Material of any width or length can be cut.

A simple, quick change of heads converts the machine into a flanger which is equally simple and easy to operate. The shoulders of the flanging rolls act as a guide for the depth of flange. Attachments and rolls can also be furnished for U-ing, wiring, special flanging and forming. The machine is furnished arranged for two cutting and flanging speeds.

In 1935 Continental Machines, Inc., Minneapolis, placed its first all-purpose die cutting band saw on the market. The machine was made possible through the development of very narrow band saw blades that came out about that time. Since then, these narrow saws have been developed to a still higher point of toughness and are made in still narrower widths. Latest model offered by this company is the V-36 Doall, a ruggedly built machine with 36 in. throat and 10 in. work height capacity. Built of arc welded steel, the housing of this 1775 lb. machine also serves as the frame. The work table tilts in four directions, is 30 in. square and 2 1/2 in. thick, box type construction.

(Left to right and bottom, respectively) The smartly styled new model V-36 Doall contour sawing machine built by Continental Machines, Inc.; Quickwork Co.'s combination throatless shear and flanger; Multi-duty spot welders manufactured by Progressive Welder Co.; Coil cradle reel just announced by the F. J. Littell Machine Co.



Industry Urged to Back U. S. Armament Program

President Lauds Cooperation Of Manufacturers in Defense Plan

Addressing the American Conference on National Defense at its industrial preparedness dinner at the Waldorf-Astoria hotel in New York Wednesday night, Acting Secretary of War Louis Johnson told industry to "get behind and stay behind the President's armament program until every phase of it is enacted into law."

Calling attention to the ominous European situation Colonel Johnson warned that the role of the neutral depends principally on ability to demand respect of all belligerents. Paying tribute to industrial cooperation with the War Department, he emphasized what industry can do to help national defense. The Administration's armament program, he pointed out, is non-partisan, merits whole-hearted support and demands a navy second to none. It calls for an army, it was declared, "small in size, compact in organization, fully equipped with the best of modern arms and capable of expansion to meet any emergency."

Colonel Johnson carried to the conference the President's acknowledgment, at the Chief Executive's request, of industrial contributions. When he had called the President's attention to these contributions, Colonel Johnson said that the President replied:

"That's fine. Add these words for me. In the revival of the spirit of national defense industry is playing a leading and vital role. I am conscious of its loyalty. I appreciate its cooperative efforts. Its patriotic services I commend as an example of good and useful citizenship."

Industry was urged by Colonel Johnson to keep an open mind on defensive needs. He expressed the belief that the President's armament program will go a long way toward strengthening America and toward minimizing dangers of attack. Lastly, he asked that industry become educated in the production of necessary war munitions.

"Of the 10,000 plants allocated for munitions purposes in this country," said Colonel Johnson, "more than 4000 of them are located in the area that extends from Boston to Wilmington and west to Pittsburgh. Pennsylvania has 1431 allocated plants. New York has 1101. Massachusetts has 711. New Jersey has 42. Connecticut has 349. Rhode Island has 148 and Delaware has 29.

"This small territorial belt I have designated is the lifeline of America. More than 60 per cent of our war needs for munitions will have to be manufactured in this congested area."

Pointing out that the War Department stood ready to assist in the program to manufacture critical items,

Colonel Johnson said that the \$42,500,000 appropriated for educational orders will provide the necessary means over a period of years to help educate those plants which have been allocated work on strictly non-commercial items.

Among organizations which he specifically named in acknowledging the debt of the War Department to industry were the Society of Automotive Engineers, the National Machine Tool Builders' Association, and the American Society of Mechanical Engineers.

Federal Truck Is Optimistic for '39

In a letter accompanying the annual report of the Federal Motor Truck Co. for the year ending Dec. 31, 1938, R. W. Rudden, president, points to current assets of \$2,143,788.19 and current liabilities of \$208,757.36—a ratio of 10½ to 1. Current assets include \$523,631.44 in cash as compared to \$434,214.61 as of Dec. 31, 1937. Federal lost \$299,269.32 in 1938 compared with a profit of \$52,754.50 in 1937.

Mr. Rudden expressed optimism over 1939 volume. This is based on the addition to the Federal line of several new models in both the low-price light-duty field and in the 1½ and 6 to 8-ton classifications. He states domestic orders for March are now far ahead of any month this year and ahead of March, 1938.

Advertising

Frank R. Campbell, Jr., and Leo J. Reynolds have formed the advertising agency of Campbell & Reynolds at 43 East Ohio Street, Chicago. Mr. Campbell was, for many years, the sales manager and advertising manager of the Felt Products Manufacturing Co. in Chicago and, previous to that time, an account executive with Van Auken-Ragland, Inc., another advertising agency here in town. Mr. Reynolds, for the past many years, has been an account executive also at Van Auken-Ragland. They have handled quite a few automotive accounts.

Associated Sales Co., Inc., Detroit producers of sound slidefilms and visual sales presentations for a number of the automobile and parts manufacturers in the Detroit area, moved April 1 into new and larger quarters at 3123-37 East Jefferson Avenue. According to Genaro A. Florez, president, the move to larger quarters has been made nec-

essary by the rapid growth of the company's business and personnel during the past year, and is coincident with the company's first anniversary under its present management.

Something new in automotive advertising is Bantam's entry into the national advertising field. For the first year and a half, Bantam advertising was confined to trade papers and aimed at securing new dealers, and newspaper advertising confined to dealer's territories designed to help the dealers sell cars, according to Roy S. Evans, president of the American Bantam Car Co. As a result of this policy, Bantam distribution has now become national, it was said, and the company is, therefore, entering publications of national circulation.

Chevrolet has announced increases in advertising space, and plans to expand its schedules in a spring sales drive.

Bennett & Snow, Boston agency, has changed its name to Bennett, Snow & Walther, and has moved to larger offices at 234 Boylston Street, Boston.

Willys Overland Offers New "Speedway Special"

A new addition to the Willys Overland line to be known as the "Speedway Special" was announced last week by company officials. The new models are available in coupes, two-door sedans and four-door sedans. In addition to the equipment which has up to this time been available on all standard models of Willys Overland cars, the Speedway Special will have larger tires, dual windshield wipers, dual sun visors, mohair upholstery, dual tail lights, a dome light, hood ornament, and a deluxe type of floor covering. The purchaser also will be given the option of a number of color combinations without extra cost.

Car Manufacturing Planned in India

A plan for establishing an automobile manufacturing industry in India has been given "detailed study," according to a report to the Department of Trade and Commerce, Ottawa, Ont., by Paul Skyes, Canadian Trade Commissioner at Calcutta. He states that the estimated initial investment will be 15,000,000 rupees sterling (about \$6,000,000) of which three-fifths will be devoted to plant and equipment and the remaining two-fifths allotted as working capital. Production, according to present plans, will be 10,000 passenger vehicles and 5,000 commercial vehicles per year. This total is approximately half the number of vehicles imported during the fiscal year, 1938.

Mr. Skyes adds that "it is not an-

anticipated that a purely domestic automobile manufacturing industry will be established in India for some considerable time to come. The general proposal, however, prompts the comment that there appears to be an excellent case for overseas manufacturers extending their present assembling operations in India to include the local manufacture of various parts, and incidental equipment. A complete domestic industry is, nevertheless, a possibility and the chances of its establishment constitute a definite threat to Canada's most important line of trade in the Indian market.

Motor vehicles form the main part of Canada's sales to India, accounting for 53.8 per cent of the total imports into that country from the Dominion during the fiscal year ended March 31, 1938.

Aeronautic Exports Up Over 30 Per Cent

The exports of aeronautic products from the United States during February amounted to \$6,772,182, an increase of 38 per cent over January and 31 per cent above February, 1938, which totaled \$5,152,583, according to a report by the Department of Commerce, Bureau of Foreign and Domestic Commerce. Exports for the months of January and February totaled \$11,664,400 an increase of 40 per cent over the first two months of 1938 which amounted to \$8,342,864.

During the first two months of 1939 exports of aircraft increased 90 per cent in number and 89 per cent in value as compared with the same period of 1938. Engines decreased 9 per cent in number while the value increased 6 per cent; the value of parachutes and parts was 426 per cent greater, while other parts and accessories were off 3 per cent.

Vega Seeks Capital By Stock Addition

Vega Airplane Co., an affiliate of Lockheed Aircraft Corp., is reported to be contemplating methods of obtaining additional capital. Lockheed recently obtained additional funds by an offering of stock and Menasco, manufacturers of airplane engines, now is working on a similar plan.

Passenger Car Financing Up

The dollar volume of retail financing of new passenger automobiles was 21.1 per cent higher in February than during the same month of 1938, and 28.2 per cent off from February, 1937, according to preliminary estimates of the Department of Commerce. As compared with January, 1939, there was a slight increase of 1.1 per cent.

Copper Prices Reflect Indirect Pressure of Automotive Buying

Little Change in Steel Orders From Automobile Manufacturers

The artificial price set-up in the copper market which has prevailed for the last few months came to an end this week with announcement by one of the large custom smelters of 10% cents, Connecticut Valley, as the price of electrolytic. Nominally, this denotes a reduction of \$10 per short ton from the 11¼ cents per pound price, which mine producers and custom smelters had clung to since Oct. 14, 1938, although in the open market copper was obtainable throughout most of that period at considerably lower prices. Early this week there were sellers in the open market at 10% cents. While more copper is being used in the manufacture of automobiles than in any other industry, except that of electrical manufacturing, virtually all of the buying is in fabricated form and while eventually prices of cast, rolled, or drawn products respond to the movement of the basic metal markets, prices are not always as speedily revised as consumers would like to have them. Formerly the custom smelters promptly disposed of their intake at the best obtainable price, thus permitting the law of supply and demand to have full sway. Commodity Exchange futures, with deliveries when the contracts mature, tend to modify the former system's immediate effect on price when more copper is available than wanted. Indirect pressure on the price of the red metal resulted in part from the slowing of the demand for fabricated copper products of automotive consumers. The best estimate obtainable has it that the more favorably situated Connecticut mills are operating at around 60 per cent of normal, while others are said to be running at or near half of capacity. Copper's statistical position has also aggravated the market's condition, domestic stocks having increased in spite of curtailment of output while world stocks are at the highest level since last summer. The political situation in Europe being what it is, no one would be surprised if the lagging copper demand were suddenly to change into active buying for armament and munitions and it is for this reason that some of the mine producers hesitated to follow the footsteps of the custom smelter in lowering the price of copper. The price of brass ingots, which are made from scrap, was reduced by ¼ to ½ a cent.

The tin market turned easier, with spot Straits quoted early this week at 46¼ cents. Reports are current that some of the signatories to the International Tin Agreement are slow in living up to the quota regulations and buffer pool contributions are said to be lagging from some of the tin producing countries, especially so from Bolivia.

Steel orders from automobile manu-

facturers are not coming out any more freely than they have in the past few weeks, but at that a fair volume of fill-in business is reported. Prices are unchanged. The rate of ingot output receded this week to 54.7 per cent of rated capacity.—W. C. H.

Graham-Paige Reports Loss

Gross revenue for 1938, of the Graham-Paige Motors Corp., from the sale of 3,902 cars, 1,532 tractors amounted to \$4,782,448.09 compared with \$13,060,226.42 from the sale of 16,577 cars and 243 tractors for the year 1937, according to the company's annual report to stockholders. Net loss for 1938 was given as \$1,920,186.38.

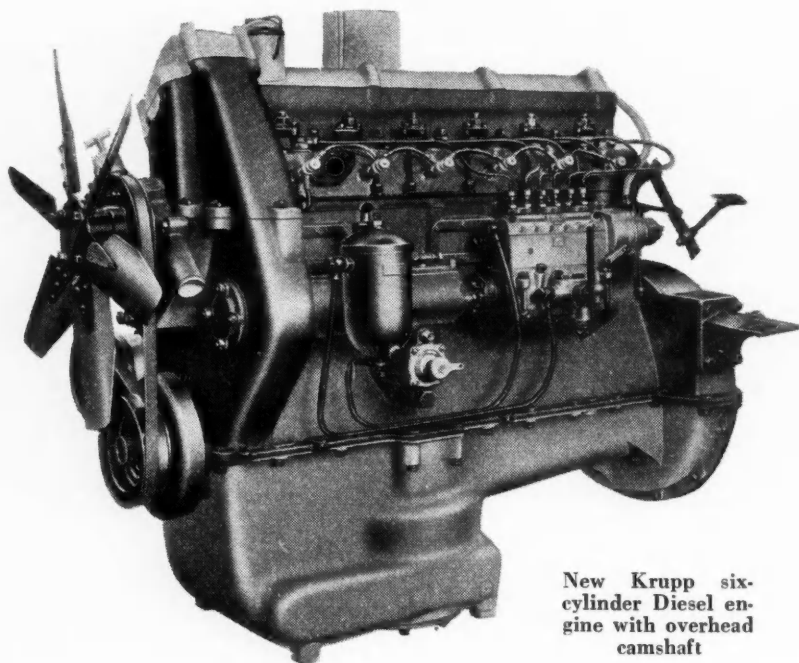
Calendar

Conventions and Meetings

- National Automobile Dealers Association Annual Meeting, San Francisco April 17-20
- Chamber of Commerce of the United States, Annual Meeting, Washington, D. C. May 2-4
- American Roadbuilders Association, Annual Meeting, San Francisco, May 7-10
- The National Battery Manufacturers Association, Spring Convention, The Greenbrier Hotel, White Sulphur Springs, West Virginia May 11-12
- American Foundrymen's Association, Forty-third Annual Convention, Cincinnati May 15-18
- SAE World Automotive Engineering Congress May 22-June 8
- National Metal Trades Association, Annual Meeting, Chicago.... May 24-25
- American Iron & Steel Institute, Annual Meeting, New York City.. May 25
- American Society for Testing Materials, Annual Meeting, Atlantic City June 26-30
- Automotive Engine Rebuilders Association, Seventeenth Annual Convention, Baltimore, Md. July 5-7
- National Petroleum Association, Annual Meeting, Atlantic City, Sept. 14-15
- American Welding Society, Annual Meeting, Chicago Oct. 22-27
- American Trucking Association, Annual Meeting, Chicago Oct. 23-24
- American Petroleum Institute, Annual Meeting, Chicago Nov. 13-17
- National Independent Traffic League, Annual Meeting, Chicago.... Nov. 23-24

Shows at Home and Abroad

- Great Britain, London, Automobile Show Oct. 12-21
- Italy, Milan, Automobile Salon, Oct. 25 to Nov. 11
- International Automobile, Motorcycle and Motor Boat Show, Budapest, Oct. 27 to Nov. 6
- Great Britain, London, Commercial Automobile Transportation Show, Nov. 2-11
- Great Britain, Glasgow, Scotch Automobile Show Nov. 10-18



New Krupp six-cylinder Diesel engine with overhead camshaft

One of the most interesting developments is the practical disappearance of six-wheelers, a type that has figured prominently in German production in the past. Practically all models now shown are of the cross-country type, on which tax relief is granted to purchasers.

The number of bus-chassis types has been reduced to nine, these being modified truck chassis. Special types of vehicles, such as street sweepers, ash-collecting vehicles, and trolley buses, are not affected by the rationalization scheme.

Under prevailing conditions as briefly sketched in the foregoing, no radically new designs could be expected at the show. Only well-known models were exhibited, and while

German Truck Makers

By EDWIN P. A. HEINZE

IN the motor-truck industry the German Government is carrying through its rationalization scheme in a drastic manner. Col. von Schell, coordinator of the automobile industry, paid a surprise visit to the Berlin automobile show on the night before the official opening. On some of the stands he found vehicles of types for which a production permit had not been issued, and all such vehicles had to be removed from the show. Individual manufacturers have had to reduce their chassis types as follows since last year: Mercedes-Benz, seven to three (plus one model for export only); Büssing-NAG, eight to two; Henschel, eight to one; Faun, five to one; Borgward (formerly Hansa-Lloyd), six to two; MAN, four to two; Vomag, five to one; Krupp, five to two; Magirus, three to two; Phaenomen, two to one.

Last year the makers listed above produced 52 different models between them, of which only 18 remain. While it is irksome to the manufacturers to have to discontinue established models, most of them, fortunately,

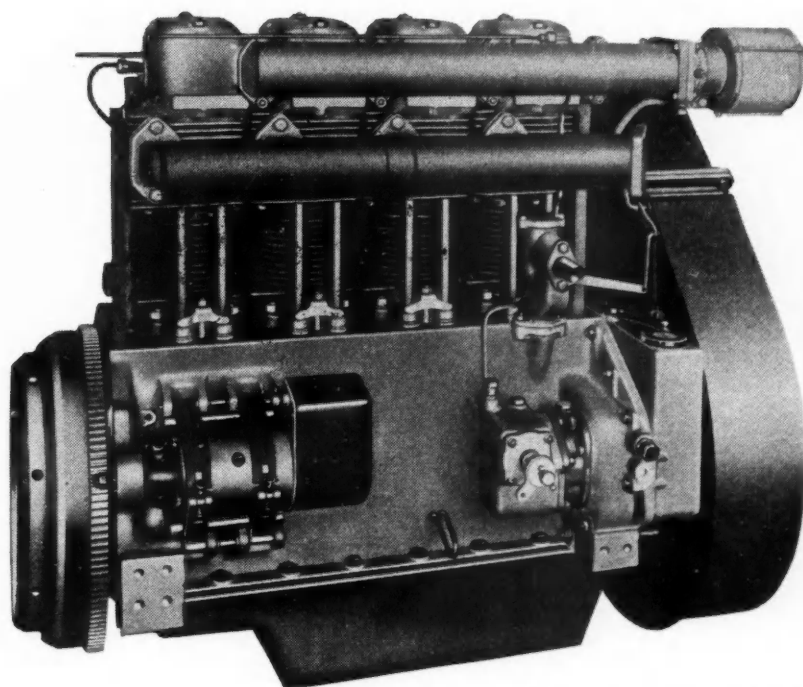
are well supplied with orders and, besides, there is the comforting reflection that hereafter they will be protected from ruinous competition by the fact that the Reichs Commissioner for the motor vehicle industry will restrict the types which any maker can produce. Daimler-Benz hereafter will turn out trucks of 1½, 3, and 4½ tons carrying capacity; Büssing-NAG, of 4½ and 6½ tons; Henschel, 4½ tons; Magirus, 4½ tons; Vomag, 6½ tons; Krupp, 3 and 6½ tons; Faun, 6½ tons; Phaenomen, 1½ tons; Borgward, 1, 1½, and 3 tons. So far, Opel and Ford have not been affected by the new order of things, both continuing to produce 3-ton models. Future German production therefore will include three 1½-ton models, six 3-ton and five 4½-ton and 6½-ton each. No decisions have yet been reached regarding the future outputs of the former Austrian and Czechoslovakian plants. Most of them exhibited 4½-tonners. The firms represented at the show were Austrian Saurer, Austro-Fiat, Fross-Büssing, Graf & Stift, and Tatra.

they incorporated certain detail improvements, few of these were visible from the outside. Most of these improvements are designed to permit of sustained high speeds on the super highways. The Diesel engine still dominates, which is probably due to the fact that it has now become possible to produce gas oil in sufficient quantity by the hydrogenation of lignite and coal. In some cases bearing sizes have been increased and lubrication systems improved. The use of low-reduction fifth speeds in the transmission, having the effect of overdrives, has increased. As regards brakes, the smaller trucks for the most part are equipped with the Lockheed hydraulic type, which is produced in Germany by Alfred Teves, Frankfurt-on-Main. Larger trucks usually either have brake boosters or else regular air brakes of the Knorr, Westinghouse, or Bosch type.

While gas generators appear to make only slow progress, much use is being made of liquefied gases. The three principal concerns engaged in the production of such gases are

very active in promoting their use. The distribution of liquefied gas in bottles is being more thoroughly organized, in conformity with regulations issued by the authorities, which permit only as many new trucks and buses for operation on liquefied gas to be registered as the supply of this gas warrants. All gas vehicles must retain their equipment for the use of liquid fuel, so they may be operated on gasoline when necessary. It appears that the use as motor fuel of illuminating gas carried in pressure vessels is not making much progress.

Not only production but also research in the motor-vehicle field is being rationalized. A research committee under the patronage of the



Phaenomen four cylinder
blower-cooled Diesel engine

Moderate Offerings at Show

With simplified and fewer models. Eight factories displaying 52 models last year reduce lines to 18. Six-wheelers have disappeared.



MAN sight-seeing bus for the National
Convention Park at Nuremburg



Interior of Henschel transit-type 42-passenger bus

German Minister for Transport decides what research projects are to be carried through and who is to be entrusted with any particular project. Special "institutes" have been organized for this work at the various engineering colleges, and at the automobile show a large section in one of the halls was reserved for this work, numerous research set-ups being demonstrated. This research program covers problems arising in connection with accessories and parts as well as in connection with materials, and is being pushed energetically. It is not intended to stifle private initiative and the development of new designs; on the contrary, one of the objects is to investigate every new idea most thoroughly. One plan under consideration is the development of a standard hitch for trailers. There also is a possibility that final drives will be standardized for certain truck types, and as a possible first step in this direction, it was noticed that the 4½-ton Daimler-Benz truck is now equipped with the hub-drive rear axle developed and used for years by MAN.

The Daimler-Benz 1½-tonner is fitted with either a six-cylinder 45-hp. carburetor, or a four-cylinder Diesel engine. For export this company lists a 2½-tonner built along the lines of the 1½-tonner, and a small 2-ton model with four-cylinder Diesel or carburetor engine of 55, 60, or 70-hp. output.

Characteristic features of the Büssing-NAG chassis are retained, but on the 4½-ton chassis the output of the six-cylinder Diesel engine has been increased to 100 hp., and the truck is now fitted with a five-

speed gearbox, the fifth speed serving as an overdrive. Hydraulic brakes are fitted and are applied by means of compressed air. The 6½-ton model has a "one-shot" chassis lubrication system and a double-reduction rear axle. Its six-cylinder Diesel engine develops 145 hp. Otherwise the truck is similar to the 4½-ton model. The company also produces a bus chassis with forwardly-located driver's seat and low-floor frame.

MAN, which went in strongly for electric welding of chassis frames some years ago, has returned to the riveted frame. Both MAN models have a channel-section frame with straight siderails, two tubular intermediate cross members, and channel-section front and rear cross members. The rear axles of both are of the hub-drive type. The 4½-ton model is equipped with a 115-hp. Diesel engine located high up on the frame to permit of a front driving axle being fitted for four-wheel drive. A separate four-speed gearbox is normally fitted. While the smaller truck has a single-plate clutch, the larger one has a multiple-plate clutch and a five-speed gearbox; its six-cylinder Diesel engine develops 150 hp. In addition to these two truck models the company lists a 100-hp., 42-passenger bus with the driver's seat on the left side of the engine. The trolley bus is also being continued.

The new Krupp 3-ton truck is similar to the former 2½-ton model but is equipped with a new six-cylinder 80-hp. Diesel engine of the prechamber type, of 3.94-in. bore and 4.72-in. stroke. Valves are actuated from an

overhead, chain-driven camshaft. The 6½-tonner is an old model with a Krupp-Junkers opposed-piston Diesel engine and a five-speed gearbox. Krupp also produces a bus on a modified 3-ton truck chassis with low-floor frame. This firm adheres to the welded form of chassis frame.

On the Henschel 4½-ton truck chassis, equipped with a six-cylinder Henschel-Lanova Diesel engine of 95 hp., a new and simpler control for the injection system has been provided. The former Henschel mean-effective-pressure control (or torque-control), with its throttling jets and relief valves, has been discarded, and increase in the fuel quantity with increase in engine speed (for the same control-rack setting) is now prevented by a spring which at high engine speed pulls back the control rack on the Bosch pump. It is interesting to mention that this engine is fitted with a cast crankshaft, which type of crankshaft has been adopted also for the standardized Diesel engine of the German army. This truck is equipped with a five-speed gearbox and Bosch air brakes. The frame is riveted, and in the case of the bus chassis it is slightly arched over the rear axle. Tractors are no longer being built by this company.

A feature of the Vomag 6½-ton truck chassis is the provision of two hand-brake levers by means of which it is possible to obtain a braking effect equal to that of the Knorr air brakes. The two brake levers work on a compensating bar. Wear of the brake lining can be checked through inspection holes in the cast-steel wheels. A modified form of this chassis is supplied for buses. Vomag also builds a 100-hp. tractor designed to haul loads up to 24 tons.

Phaenomen continues its 1½-tonner with four-cylinder, air-cooled 40-hp. engine. A center of attraction on the Phaenomen stand was a new four-cylinder air-cooled Diesel engine of 245 cu. in. displacement and 60-hp. output, designed on the same lines as the carburetor engine. Aside from the fact that a turbulence-type combustion chamber is employed, no details could be obtained.

Hanomag has discontinued the manufacture of trucks, but still produces several lines of tractors. Several small companies also are engaged in the production of small tractors equipped with either single-cylinder or two-cylinder Diesel engines. There is a considerable market for such tractors, as motorization of agricultural work is being strongly urged by the authorities.

Just Among Ourselves

Safety Literature In De Luxe Form

LAST week Harper & Brothers published a neat, green book called "Seven Roads to Safety." The author is Paul G. Hoffman, president of Studebaker, with Neil M. Clark collaborating. Much of the material in the book has appeared previously in *Life* magazine, and the March of Time, but curiously enough, as happens in many like cases, collecting the material between covers has given it new vitality, and it makes good reading—again.

Author Hoffman stopped briefly in Philadelphia on March 31 to give a speech at a dinner of the Franklin Institute honoring the manufacturers who developed high-test safety glass on a cooperative basis. He said in that speech, as he has said before, that the only thing more arduous than listening to a safety speech is giving one. But he also proved, once again, that if PGH is making the speech it is no trial for the auditors.

Incidentally, he was followed on the safety-glass program by Stewart McDonald, now Federal Housing administrator, and once president of the Moon Motor Car Co. Remember the Moon? John D. Biggers, president of Libbey-Owens-Ford, was at the head table. The toastmaster recalled his earlier connections with Graham Paige and Willys, and also that he had ended the Census of Unemployment with a lot of money left over from the Congressional appropriation made for the purpose. This announcement got the largest cheer of the evening.

We Disagree With Corwin Willson

THE ideas of Mr. Corwin Willson, of Flint, Mich., are always stimulating to this department, even when they provoke the most violent disagreement. Mr. Willson calls himself an "integrating engineer and industrial designer." During the past five years or more his primary concern has been with mass shelter. With William B. Stout, Alexander Pribl and a few others, he has composed a small, but extremely articulate bloc of those who see in the mobile home something of more social significance than a trailer which is dragged casually behind a car during vacation periods.

Mr. Willson believes that while "actually

decreasing the manufacturing costs of stock cars, they can be designed to feed and sleep all their occupants in comfort and decency."

The present car, he finds, is little more than a mechanical substitute for the horse and buggy. It pampers the class-consciousness of the buying public without meeting its underlying needs.

"Many kinds of motor vehicles are badly needed," he says. "Not only light, less speedy, cheap small units to be used primarily for short-distance touring, but much larger, slow 'land cruisers' which provide an entire family with all the necessities and many of the luxuries of living year-round in any climate.

Somewhere between the primitive yurt and the "would-be mansion" of our present scale of middle-class housing, Mr. Willson visualizes the possibility of "finding the simplest means of giving the shell (of the family shelter) a form so substantial but inexpensive, so adapted to our changing needs, so divorced from prejudicial traditions, so dynamic and exciting that a considerable number of consumers from every income group will want to own and live in it. Today's trailer intrigues the millionaire as much as the poor man for the reason that mere comfort has not been provided at the expense of freedom, vitality and adventure."

There is hardly space here to discuss all of the terrifying implications of Mr. Willson's vision. He faces himself the problem—the recurrent economic problem—of the effect on the older housing industry of putting a sixth of the population in mobile houses.

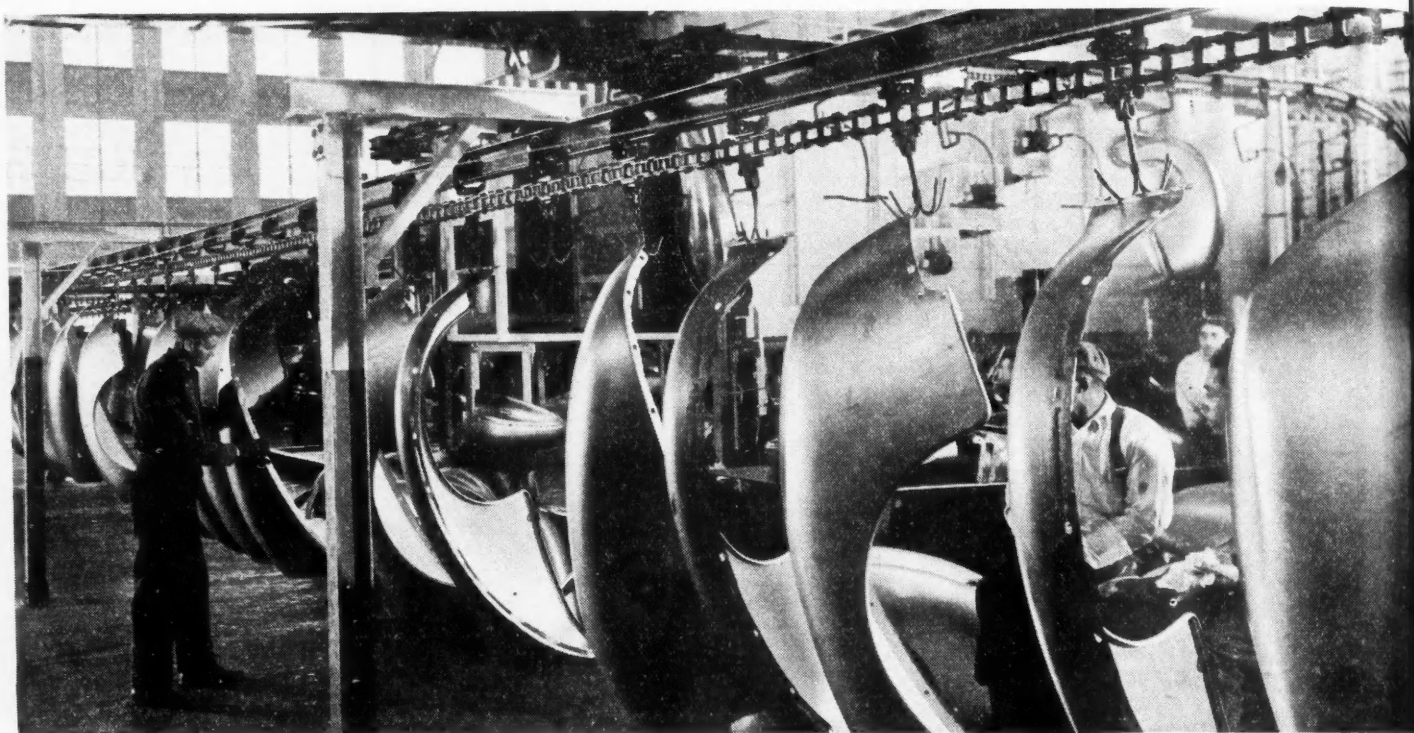
Not a word anywhere, however, about the problems of mobile houses when they are herded into communities with no communal responsibility for sanitation, sickness, for debt and disaster.

As we see it, if a large portion of the population becomes mobile, the relatively fixed portion will be holding the bag in terms of paying for the others' fun, in terms of taxes and responsibility. Where such situations have arisen locally, the permanent residents have shown an understandable (to us) tendency to resent it in legislative terms.

Mr. Willson forgets that the primitive tribes, which lived so healthily in their felt yurts, traveled as tribes, with a well organized tribal responsibility. The tribe, not the family, was the mobile unit, for economic reasons.

As we see it, a nation of gypsies would inevitably degenerate toward the gypsy level of squalor and lack of achievement. And even the gypsies have a form of tribal control over their mobility. A nation of rugged individualists on wheeled houses is not conceivable as a permanent basis of social organization.

—HERBERT HOSKING



Overhead conveyors play a controlling part in transporting materials and work in the press shop. Here is a small section of one of the feeder conveyor lines

By JOSEPH GESCHELIN
TWO gigantic projects—the major units in the \$34,000,000 expansion program of the Ford Motor Company—the press shop and the tool and die shop were placed in operation early in January this year. Each was designed to promote the Ford idea of straight-line production and incorporates many advanced principles both in layout and in tooling.

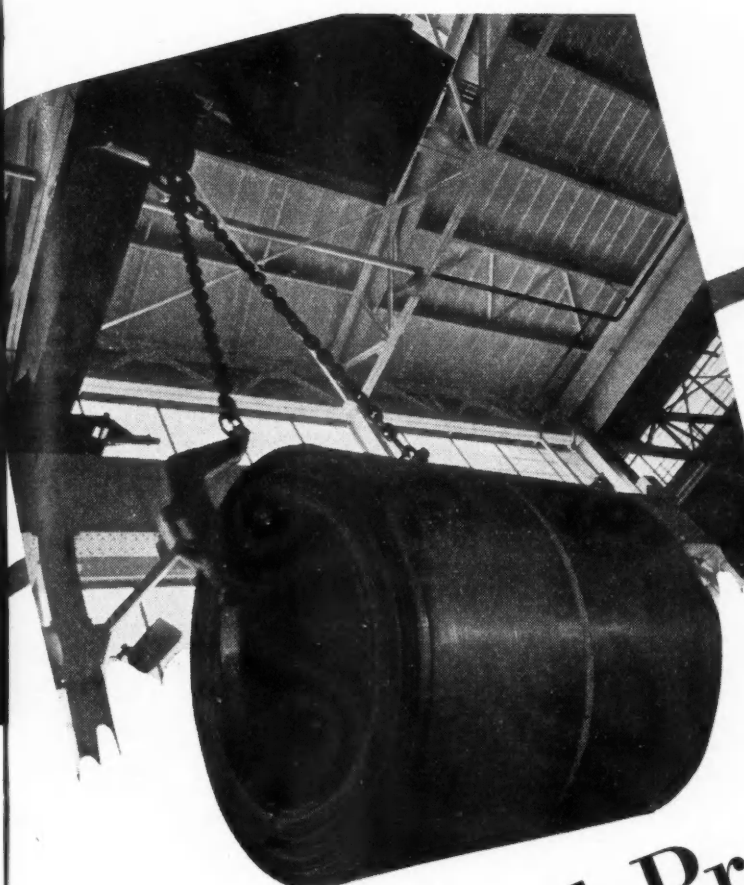
The press shop has 1,500,00 sq. ft. of floor space, with 850,000 sq. ft. on the main manufacturing floor, the remainder in the above-ground basement floor. The building, an L-shaped structure, forms an integral part of a united building covering 64 acres and is three-fourths of a mile long and 1000 ft. wide. The new building joins the old press steel building, the spring and upset building and the rolling mill, the latter in turn being connected with the open hearth. The connection with the buildings mentioned was formed by bridging over the main roadway through the plant. The main part of the new building itself is 1660 ft. long and 392 ft. wide, while the ell is 664 ft. by 240 ft.

The new press shop contains 2100 presses, 300 of which are new items of equipment. The presses range from the small inclinable units to the very largest streamlined triple-action units known to the art. Construction of the press shop has increased the plant's capacity of 2000 bodies a day. It permits the company to take steel from the rolling

mill to the shop where it is blanked, stamped, or drawn, welded into sub-assemblies and shipped in the "white" to branch assembly plants in specially fitted railroad cars.

Mechanization of all materials handling operations is one of the outstanding features of the press shop. Here will be found a veritable maze of overhead conveyor lines for trans-

*An expenditure of \$34,000,000
 promotes new achievements in
 tool and die shop, and higher—
 Efficiency at*



Most of the raw material comes to the presses in coils as shown here. These rolls are handled by overhead cranes which traverse the entire press shop area

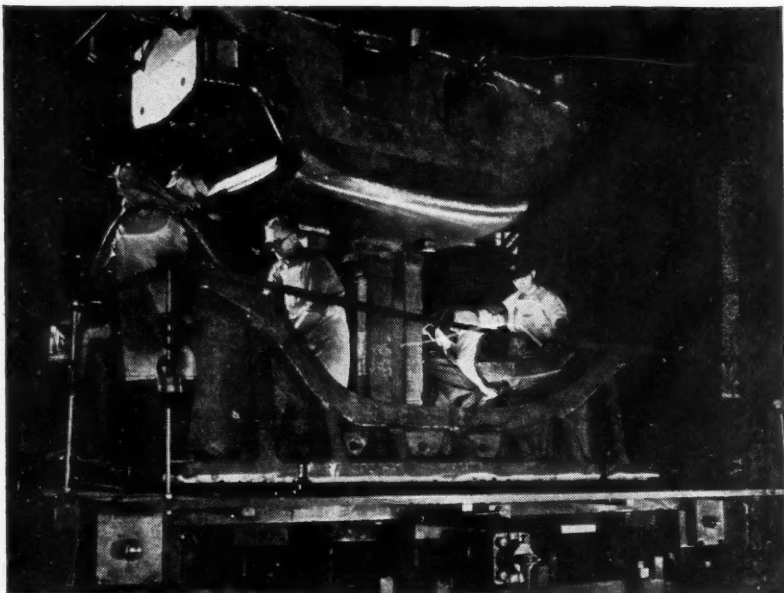
t the New Ford Press Shop

porting raw and finished stampings. Some idea of the size of the conveyor system may be gained from the fact that the shipping conveyor alone is approximately four miles in length.

In laying out the building, it was arranged to have the heavy fender presses at the end of the ell near the steel storage, which is fed by the rolling mill. Smaller presses and welders are arranged nearby for trimming and welding operations. Right fenders are drawn on two machines, lefts on two others. A blanking press and oiler scrubber feeds

Some perspective of the layout of the press shop may be gained from this view of one of the progressive lines. In the foreground are the mighty presses in the fender line





(Above) Important section of the die shop houses a battery of huge spotting presses, one of which is the largest made to date. Here is a close-up of a gang of die makers spotting a die for the Ford roof panel draw punch

each pair of machines. The blanks go from the oiler into stacks for feeding into the draw dies. From the draw dies, conveyors take them through a soap and water spray chamber, conveyors also transporting the completed fenders.

The front grille stamping departments are near the fender presses. Body and side panels and steel tops are made on still another great line along the side of the ell and the end of the main section of the structure. Behind and around these presses are smaller machines for succeeding operations, with still smaller ones nearby to make small parts from scrap from the bigger machines. This arrangement reduces handling. Still other departments produce doors, brackets and dozens of other parts.

An advantage of the press shop arrangement is the ease with which the presses may be rearranged due to future product changes. Presses may be picked up by one of the three 90-ton overhead cranes, moved to a new location, and lowered into place on the supporting structure already located below the opening provided in the floor. The floor itself is made up of 1-in. steel plates surfaced with cedar blocks. The plates are screwed to steel floor beams designed to carry the load of material in transit through the building.

The three cranes mentioned above have a 95-ft. span and a hook clearance of 37 ft. 6 in. In addition to these, there are four 60-ton, seven 20-ton and two 15-ton cranes in the building, with spans of 75 to 85 ft.

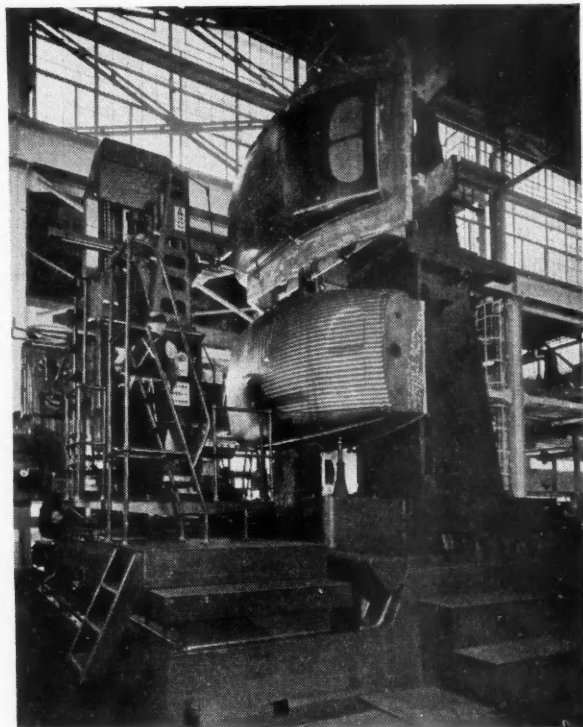
Now that the Gargantuan task of

planning, erection, and actual operation has been completed, the press shop management is turning its attention to the further development of new tooling and unique techniques designed to facilitate production and reduce operating cost. A part of this program is an experimental project for developing a novel means of automatic blank ejection, now in actual operation on several presses.

In principle, as the ram starts on its upward stroke after completing the blanking operation, a row of vacuum cups engage the blanks and carry them upward. At this point in the cycle, a feeding device con-

sisting of a row of bars fastened to a reciprocating chain mechanism slides in over the press bed. The cycle of events is so timed that as the conveyor reaches this position, the vacuum is broken and the blanks drop on the bars. The unloader continues its rapid movement forward and out of the press bed, discharging the blanks.

When the mechanism has been perfected it will be installed on many of the blanking presses in various lines. Incidentally, the principle of using the vacuum cup for handling blanks is being extended to other types of operations, particularly in handling blanks stacked in a maga-



(Right) One of the largest of the Keller machines, part of a battery of 17 units, is shown machining a Ford roof panel draw punch from the master model

zine for feeding progressive dies on small formed parts.

Another important experimental project is that of fitting certain presses with safety controls operated by electronic relay mechanism in which the interruption of the light beam forces the ram to retract automatically. Several presses have been equipped with an improved electronic device of this type.

Interesting section of the press shop is the tight department for producing gas tanks. There is a short progressive line of new resistance welders for welding the seams and for the attachment of brackets and

other separate pieces. In the first operation on this line, the two long seams of the tank are produced simultaneously by going through a seam welding machine really consisting of two welders, synchronized, and set on each side of the table. The short seams then are completed on a small seam welder.

A most unusual piece of equipment is an automatic machine for testing complete tanks for soundness. In appearance, this machine is closely akin to the familiar automatic plating equipment. In principle, there is a large steel tank of U form traversed by a closed overhead conveyor loop, carrying suitable work holding fixtures. Each fixture is arranged to clamp automatically and each one is fitted with an air line connection carrying about 15 pounds air pressure.

The tanks are loaded into the fixtures at the open end of the U and the air connection attached. Then the fixtures dip deeply into the clear water tank, proceeding around the bend to the unloading station. Inspection for leaks is a very simple matter under these conditions.

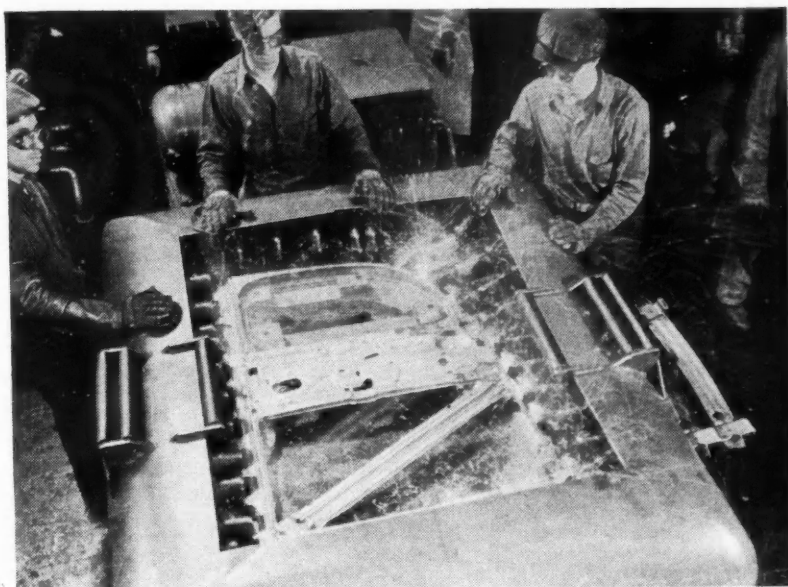
The tool and die shop is completely air-conditioned and concentrates almost all the Rouge plant tool and die work under one roof, permitting the company to do practically any job of this sort, regardless of its size. The toolrooms now scattered through the plant will handle only

maintenance work. The structure is thought to be the largest building in the world designed solely for this purpose. It is 1,225 ft. long and 300 ft. wide. There are 1,311 machines in the shop, 508 of them being new. At present it accommodates about 1,900 men.

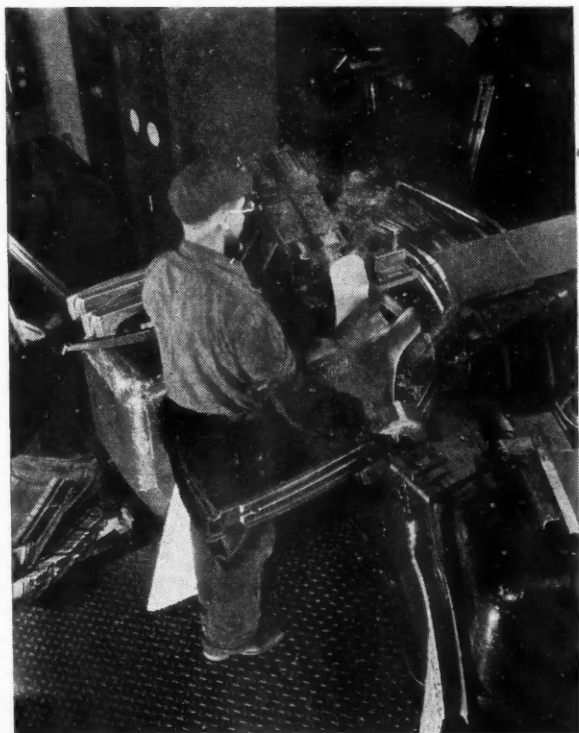
This plant has three main divisions: 1. Body die and small die construction; 2. tool, jig, fixture and gage division; and 3. the machine construction and repair division. In the last named, new machines and special equipment are built, and general overhauls made on all kinds of plant machinery.

Advanced feature here is a spacious heat treating department with ample equipment for handling all of the heat treating work required by the department. In keeping with the general scheme of good housekeeping and attractive interior treatment, all of the furnaces have been lined up along one wall and are completely encased by an attractive sheet metal housing set off with decorative stainless steel strip to cover edges and joints. Pyrometers and other control instruments are housed in this sheet metal panel.

A battery of 17 of the familiar Keller machines are arranged in a



(Above) This is a close-up of another of the automatic resistance welding machines for door assembly



(Left) Electric welding is used for all manner of assembly operations from small sub-assemblies to the welding of the complete body shell. Operation shown here is that of resistance welding a door frame

section of the building devoted to the machining of large dies. These machines range in size from the medium sized models to several which represent the largest equipment of this type.

The spacious, uncluttered arrangement of the building and its excellent daylight lighting are conspicuous features. The high central bay runs entirely through the building, with two lower bays on either side. There are monitors at right angles to the central monitor to admit maximum daylight to the interior. Columns are held at a minimum. Monitors, side walls and walls are largely of glass, and the building itself is set well away from other plant buildings so that sunlight is unobstructed.

The color scheme adds to the effectiveness of the lighting arrangement.
(Turn to page 475 please)

General Motors Slides into

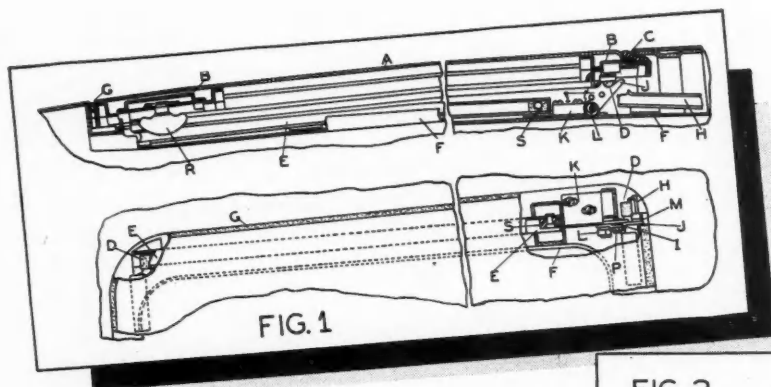


Fig. 1. Longitudinal vertical section and plan view, with parts broken away, of sliding roof panel

Fig. 2. Pivoted track extension and associated parts just before the final closing movement of the sliding panel.

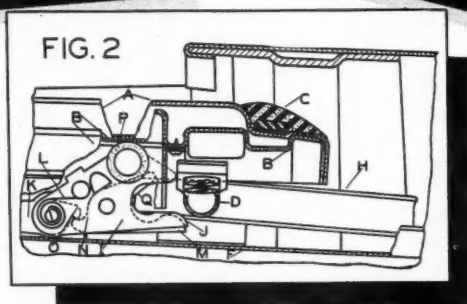
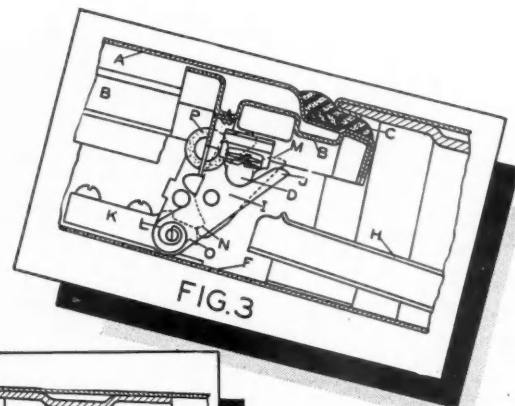


Fig. 3. View similar to that shown in Fig. 2, with the panel in the completely-closed position



- | | | |
|-------------------------------|------------------------------|----------------------|
| A—Sliding panel. | H—Track for rear trunnion. | L—Spring. |
| B—Frame of sliding panel. | I—Track extension mechanism. | M—Dog. |
| C—Sealing strip. | J—Member of track ext. mech. | N—Nose. |
| D—Trunnion. | K—Member of track ext. mech. | O—Locking lug. |
| E—U-shaped track. | | P—Rollers. |
| F—Trough under sliding panel. | | Q—Seat for trunnion. |
| G—Sealing strip. | | R—Handle. |
| | | S—Rubber bumpers. |

By P. M. HELDT

THE sunshine top or sliding roof made its appearance on stock cars in this country for the first time last fall, when several divisions of General Motors Corporation announced models embodying this feature. It will be readily understood that the design of a sliding panel in the roof of a car involves a number of interesting problems, because the roof must be neat in appearance, the sliding member must be easy to operate and free from rattle in both the open and closed positions, and the roof must be rain-proof when closed. We are, therefore, glad to be able to reproduce herewith a number of drawings illustrating how these problems have been worked out in the G.M. design.

For the sake of neat appearance,

the sliding panel when in the closed position must be flush with the edges of the opening in the roof all around. This is easily accomplished so far as the forward edge is concerned, by sliding the panel into place on suitably arranged tracks; but the rear portion of the panel cannot be thus slid into place.

The sliding panel is mounted on tracks, and when it is desired to open the roof, this portion is slid into position below the rear, fixed portion. The rear tracks are provided with pivoted extensions which when the sliding panel approaches the closed position, receive trunnions mounted on its rear end and, on continued movement, guide the rear portion in a circular path forwardly and upwardly into sealing engagement with the edges of the roof

opening. Suitable means are provided for locking the panel in this position, so designed that rotation of the handle toward the locking position gives the operator a mechanical advantage in moving the sliding panel forward.

Referring to Fig. 1, sliding panel A is a sheet-metal stamping with flanged edges, reinforced by frame members B. At its rear edge it is provided with a sealing strip C of rubber or similar material. At each of its corners a felt-covered trunnion D is secured to the frame member B. The forward trunnions ride in U-shaped tracks E in the bottom of an annular trough F. This trough has a rearward extension which underlies the sliding panel when in the retracted position. Any water which may seep through the joint of the sliding panel is caught in the trough and drained off through a tube connecting to the extension at its lowest and most rearward part. The remainder of the joint is sealed by a strip G secured to the flange of the sliding panel.

the Vanguard with Sunshine Top

The trunnions at the rear of the sliding panel travel in tracks H supported by the trough extensions, except when approaching the forward limit, when they are received by the pivoted track-extension mechanism I, comprising a member J pivoted to member K, which is adjustably secured to a bracket on the bottom of trough F. This mechanism is shown in detail in Fig. 2. Spring L tends to turn member J upwardly; it prevents rattling of the parts and assists in raising the sliding member to the closed position. Trunnions D are held in the fork of the pivoted track extension J by dog M. The latter is pivoted to the track extension and has a nose N adapted to engage a cam surface on locking lug O. At the other end of dog M there is a forked extension having a seat Q adapted to receive the rear trunnion D. A felt-covered roller P is pivoted on the upper portion of track extension J. Top panel A rests and rolls on this roller, and the weight of the panel holds the track extension in its down position.

When the panel is in the retracted

position (Fig. 2), extension member J is in line with the track and therefore in position to receive one of the rear trunnions D. If the panel is now moved forward, trunnion D engages part Q of dog M, rocks it, and causes seat portion Q of the dog to engage around trunnion D, thereby

holding the trunnion in engagement with the track-extension member. As soon as parts N and O are separated and counterclockwise motion of the track extension begins, the cam face of dog N rides on the cam face of lug O (Fig. 3), and the engagement of these two surfaces posi-

Fig. 4. Plan view of a special latching mechanism, with parts broken away and shown in section, for the closed position of the sliding panel

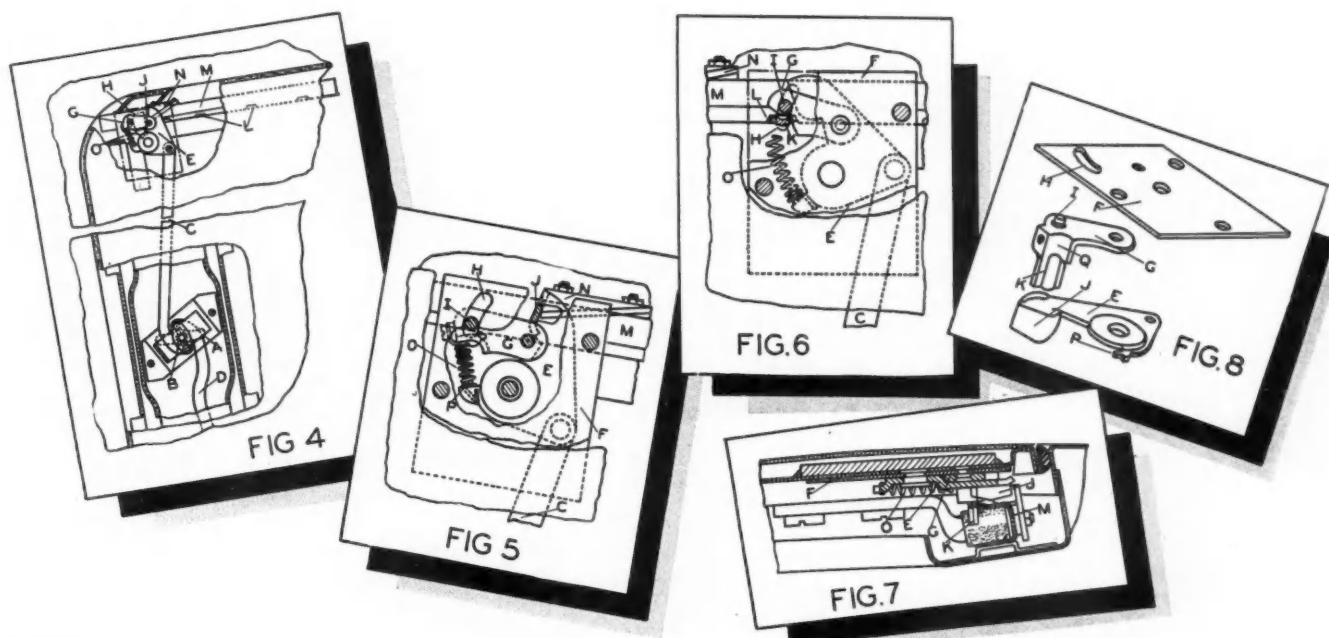
Fig. 5. Latching mechanism at one side of vehicle after it has been operated to force the sliding panel to its extreme forward position

Fig. 6. Latching mechanism, with the finger moved out of the notch in the track.

Fig. 7. Detail sectional view of one of the latching mechanisms, taken transversely of the vehicle.

Fig. 8. Parts of one of the latching mechanisms.

- | | | |
|--------------------------------|----------------------------------|-----------------------|
| A—Operating handle. | F—Plate of latching mechanism. | K—Lug on lever G. |
| B—Two-armed lever. | G—Second lever of latching mech. | L—Notch in track. |
| C—Link to operating mechanism. | H—Slot in plate F. | M—Track. |
| D—Link to operating mechanism. | I—Stud projecting from lever G. | N—Bracket on track M. |
| E—Lever of latching mechanism. | J—Downward projection lever E. | O—Coil spring. |
| | | P—Stud. |
| | | Q—Shoulder. |



tively prevents movement of dog M so as to release trunnion D. The turning action of spring L is assisted by the continued forward movement of the sliding panel. When the sliding panel has reached the closed position it is strongly pressed forward and then locked by a toggle mechanism operated by handle R (Fig. 1).

When it is desired to retract the sliding panel, handle R is rotated to release the locking mechanism, and the panel is then slid back. Since rear trunnion D is locked to the pivoted track extension J by dog M, the rear portion of the panel will move in an arc about the pivot of the track extension. After nose N of dog M clears the point of locking lug O, further movement rocks dog M and causes nose N to hold the pivoted track extension in line with track H, and at the same time releases trunnion D so that it may be slid back.

As the panel is moved back, roller P engages the under side of panel A and rotates the track-extension mechanism in a clockwise direction beyond the position of engagement of nose N with lug O, so that spring L is free to press member J and roller P against the roof section, bringing trunnions D into firm contact with the upper flanges of tracks E and H, thus preventing rattling. Rearward movement of panel A is prevented by rubber bumpers S in the rear ends of forward track sections E.

To insure a tight fit of the sliding panel in the roof opening, both the panel and the opening are tapered, with the small width at the forward end of the roof, so that the final forward movement wedges the panel into the roof opening.

To install the sliding top, track extension J and dog M are moved upwardly by hand until N and O are out of contact. Dog M is then free to move relative to the track extension, and the trunnions may enter the forks of M and track extension J. If now the sliding top is dropped into place, the engaging surfaces of J and M will move over each other and the parts will assume the position shown in Fig 2.

The mechanism described in the foregoing provides for locking the sliding panel in the closed position only. Another type of mechanism has been evolved which permits of locking it also in intermediate positions. This comprises two levers, one operated through a linkage from the middle of the vehicle, the other moved in one direction by the first

lever and in the opposite direction by a spring between the two levers. The second lever is pivoted to a plate secured to the under side of the sliding top and has a projection or finger which is adapted to engage in spaced notches in the tracks for the sliding panel. When the sliding panel has been moved directly by hand as far forward as it will go, operation of the mechanism at the center of the roof will cause the first lever to engage a bracket at the forward end of the track and force the sliding panel into firm contact with the forward edge of the roof opening.

Referring to Fig. 4, a handle A, located on the longitudinal center line of the sliding panel, has a two-armed lever B mounted on its shank. From the ends of this lever, links C and D extend to the front corners of the sliding top and are pivoted to levers E.

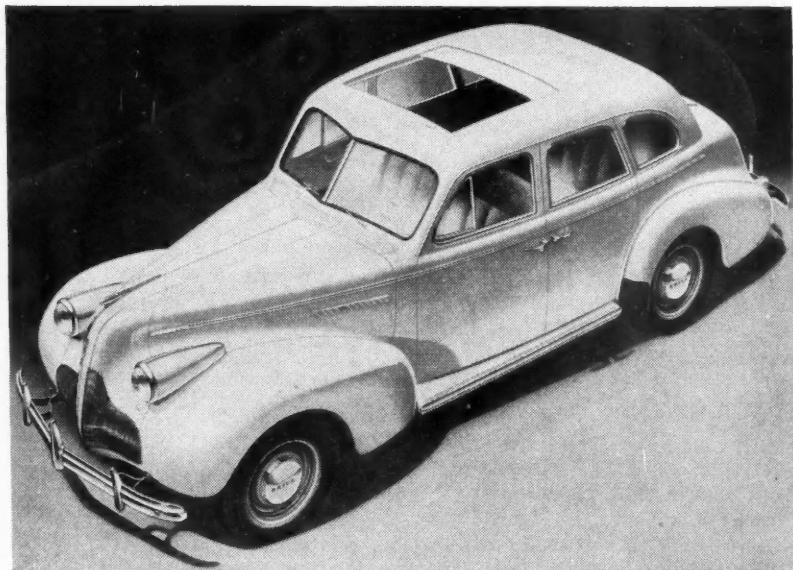
Details of the locking mechanism are shown in Figs. 5, 6, 7, and 8. Plate F at each forward corner carries a pivot for lever E, and also a pivot for a second lever G. A slot H in plate F is concentric with the pivot of lever G and takes the stud I projecting up from this lever, the stud serving the purpose of limiting the movement of the lever.

Lever E has a downward projection J which engages a downwardly extending lug K on lever G to cause the latter to swing on its pivot. Lug G is adapted to engage into any one of the notches L in tracks M. In Fig. 5 projection J is shown in firm engagement with bracket N, and if the operator moves handle A to swing links C and D to the position

shown in Fig. 4, where they are slightly over center, projection J of lever E will cause the sliding panel to be forced slightly forward, compressing the packing to give a weather-tight joint. The packing is preferably secured to the edge of the sliding panel.

In Fig. 6 the parts of the latching mechanism are shown in the positions they occupy when the sliding roof is in one of the intermediate positions or partly open, and finger K is in the corresponding notch L of track M. If the operator now desires to open the roof farther, he disengages finger K from notch L by turning handle A in the proper direction. Projection J on lever E will then engage finger K on lever G to move the finger away from notch L, and when it is thus moving away the operator may, by pulling lever A to the rear of the vehicle, cause the sliding panel to be moved to any desired position. If the handle is released, coil spring O, which is located between stud P and a shoulder Q, both on lever E, will force lever G toward track M and cause it to engage either outwardly on the edge thereof or into one of the notches L. If it is not engaged in a notch, either forward or backward movement of the sliding top will eventually cause the finger K to engage one of the notches and hold the sliding panel in the position of engagement.

The patent application for the sliding top is in the name of E. G. Simpson; while that for the latching mechanism is in the names of James H. Wernig and Gustave Chutorash.



1939 Buick sedan with Sunshine top



Spotting die from roof panel draw punch in the Ford Tool and Die Shop

Production Lines

of new gear hobbors arranged specifically for this purpose. These people are getting superior quality of surface finish and accuracy coupled with an estimated increase of tool life of the order of 35 per cent.

Flame Cutting

Valuable paper dealing with the technique of flame cutting by machine, delving into economic applications and production costs was presented at the recent convention of the International Acetylene Assn. Prime feature of the paper, "Economics of Machine Gas Cutting," by G. H. Deming, research engineer, Air Reduction Sales Co., is a mathematical analysis of all elements of cost, leading to a standard formula which can be used by anyone. The paper is much too comprehensive for treatment here, but we shall be glad to get you a copy that gives the story completely.

Fundamentals

Latest popularized technical treatise issued by the General Motors public relations department is an absorbing booklet entitled, "Electricity and Wheels." It explains the basic theories and principles of electricity, gives significant dates of discovery and development of the science, describes the role of electricity in the operation of the automobile. Although intended for the layman, the booklet has much of interest to students and technical people who may be rusty on some of the fundamentals.

Takes Coolants

January issue of *The Neoprene Notebook* discusses an important application of Neoprene. Case in point is a hose connection carrying cutting fluid on a valve refacing

machine where the connection is subjected to considerable flexing. Rubber hose stood up only a short time; Neoprene gave practically unlimited life. This is well worth investigating on other types of production machinery where flexible connections are essential.

Styles Panels

S. S. White intimates that the automobile instrument panel can be cleaned up and completely restyled by using flexible radio control. This would make it possible to locate the radio chassis in almost any convenient place in the front compartment without affecting the panel in any way. Which recalls the fact that one of our friends, a well-known stylist, has been commissioned to design some instrument panels for a prominent instrument manufacturer. What with the availability of new plastics and the activities noted above, the outlook is bright for a fresh treatment of the instrument panel for the year 1940.

Climb Cut

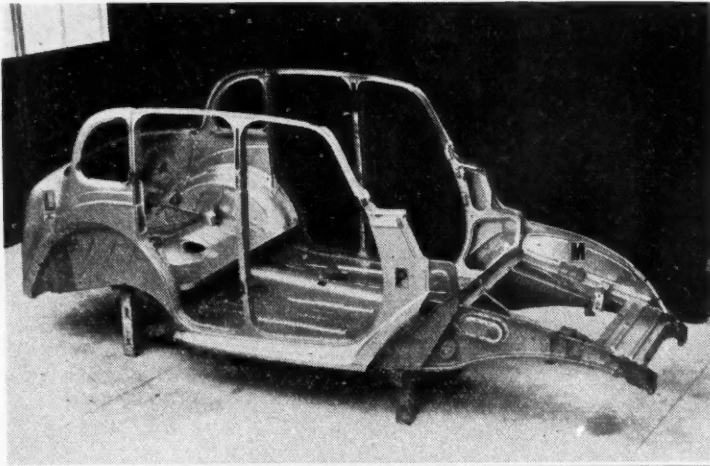
Climb-cutting, which is really a renaissance of the little used practice of climb milling, is rapidly finding wide favor in current production. Best exposition of the practice in high production is found at Spicer, where the method was applied, with surprisingly good results, on gear cutting equipment. More recently we found that a prominent manufacturer of heavy-duty transmissions had adopted the technique for hobbing gears, starting with a battery

Wear Veto

It took the piston manufacturers to focus attention on the wear-resistant qualities of certain types of metallic and chemical coatings. Such coatings now have been impressed into use on many parts of the engine and running gear units with unusual success. Coincident with the growth of applications of such coatings, it is of interest to note the use of oil and colloidal graphite treatment to provide self-lubricating quality for hard-to-get-at parts, as well as for surfaces where self-lubricating aids in break-in.

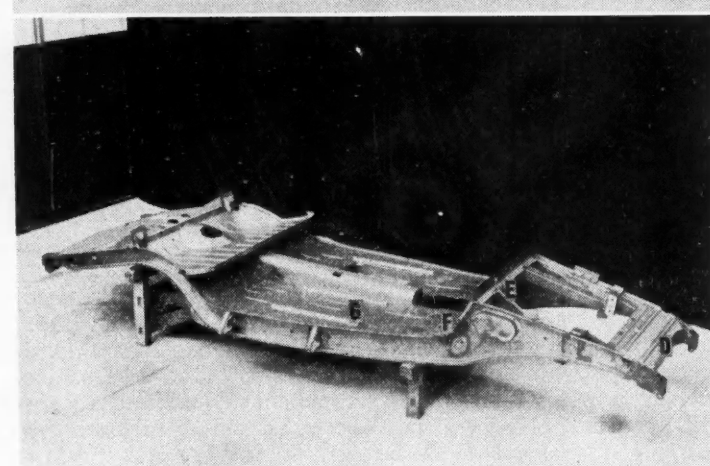
Improved Seeing

According to *Industrial Standardization*, February, 1939, an ASA committee under the leadership of the IES has prepared a tentative code recommending minimum lighting specifications for factories. Eventually, the ASA will draft a formal code based upon suggestions and criticisms of the tentative report. There are many advantages to be gained from better seeing which results from good illumination. Not the least of these are an improvement in quality, reduction in spoiled work, better productivity. For example, under good illumination it is possible to see an object about half the smallest size discernible under poor illumination. An increase in illumination from one foot-candle to a moderate level of about 20 foot-candles results in increasing the speed of seeing approximately three times. Copies of the report are available from the ASA headquarters in New York.—J. G.

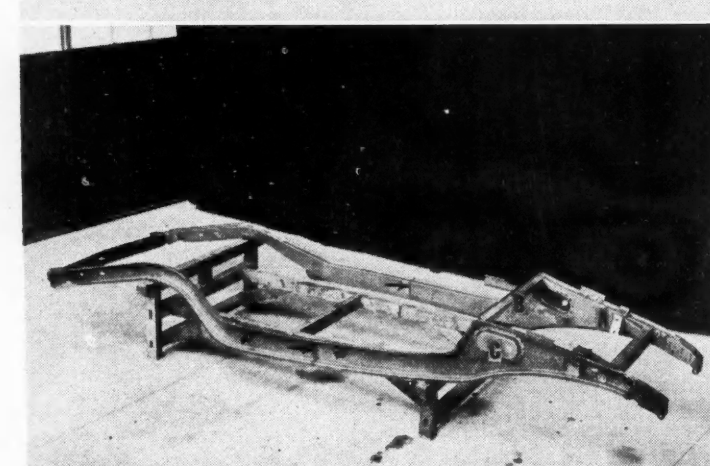


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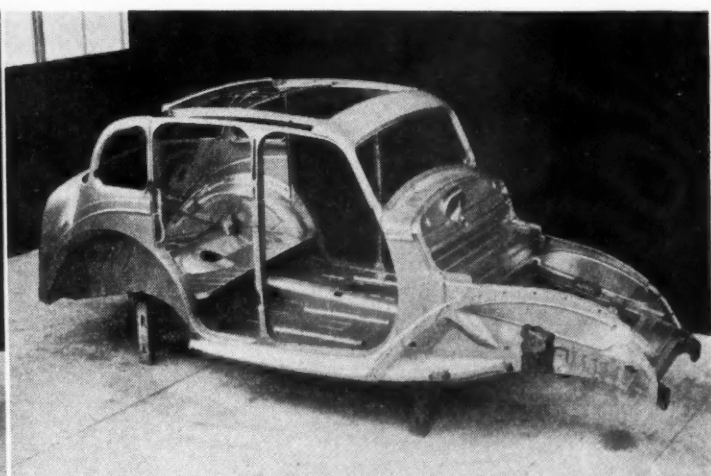
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By M. W. BOURDON

AN outstanding feature of the Morris Ten-Four, introduced last summer, is what the maker terms its "mono-construction." In its finished state the car as a whole constitutes a single unit, but at one stage in its assembly there is a separate underframe of channel-section pressed steel that extends from end to end of the car, the superstructure—the body—being built up on it, instead of being a separate unit bolted to it.

The main units of the underframe, Fig. 1, are two side members of channel section, with flanges facing outward. Originally each of these side members consists of two parts, front and rear, united by a flash-welded joint at the center. To these side members are welded the front and rear cross members, engine-mounting brackets, *A*, cowl-support cross member assembly, *B*, chassis-to-valance spacers, *C*, front brackets of front springs, rear brackets of rear springs, and various other minor units and assemblies. If replacement should become necessary as the result of an accident, either the front or the rear half of the side

Construction



56

7

members can be obtained separately from Morris Service.

The underframe assembly becomes complete at the stage represented in Fig. 2, where there are shown, welded in place, the front apron, *D*, radiator-supporting cross member, dash supporting cross member and frame-brace assembly, *E*, and the floor construction. The latter consists of four main assemblies, viz.: front floor panel, *F*, center floor assembly, *G*, with cylindrical propeller-shaft-tunnel assembly (with the right-hand and left-hand shackle brackets for the front end of the rear springs), the rear-seat-pan assembly and the spare-wheel-compartment-floor assembly. (The spare wheel is carried horizontally in a separate shallow locker below the trunk locker.) All these and other assemblies are placed in a jig prior to welding in position.

The underframe completed, the right-hand and left-hand side panels and wheel-arch assemblies are located by jig and spot-welded (as in Fig. 3) to both the top and the bottom flanges of the channel side members of the underframe, giving these members an irregular box section.



8

The side panels are one-piece pressing and include the cowl reinforcements, *H*, in front of the *A* post, the *B* and *C* posts or center pillar, and the *D* post.

In Fig. 4 erection has proceeded to the attachment of the trunk-panel assembly, *L*, and one of the front-valance assemblies, *M*. The trunk-panel assembly is secured to each side panel by a spot-welded lap joint subsequently filled with plumber's solder; spot-welding is continued along the rear ends of the wheel arches and to the underframe rear cross member.

The valance assemblies, *M* (Figs. 4 and 6), including the front shock absorber mounting brackets, front fender stay and Lockheed brake-pipe brackets, are located by a spot-welded lap joint (later filled with plumber's solder) to the front of each cowl side panel, *P*, the spot-welding being continued along the side-member flanges. In addition, these valance assemblies are arc-welded to the underframe side member brackets.

Next to be located (Fig. 5) is the dash-pan assembly, *N*; this is spot-welded to the front toe-board flange,

n of "Chassisless" Morris Sedan



Completed assembly of the Morris Ten-Four

right-hand and left-hand side panels, and front valances. Then follows (Fig. 6) the windshield panel, joined by spot-welding to the A posts and by gas-welding to the top edge of the cowl side panel, P; this joint is later filled with plumber's solder. Spot-welding is also continued along the flange of the dash pan assembly.

The sliding-roof channel assembly (Fig. 7) is located and fixed to the windshield top rail and both sides of the roof side members by spot-welding; it is afterwards braced to the roof sides by reinforcements. The roof panel and rear panel assembly, shown in position in Fig. 8, includes the drip moldings along-

side the roof, spot-welded in position, and the assembly as a whole is spot-welded to both side panels from the windshield top rail to the rear-quarter panel. It is joined to the windshield panel by butt-welding at a point in line with the front end of the sliding head opening. On fixed-head models (with no opening behind the windshield top rail) the butt-weld is continued across the full width of the roof. At the rear end the roof panel assembly is spot-welded to the top flange of the trunk panel assembly.

The right hand and left-hand drip moldings are in two parts, front and rear. The front ones are spot-

welded to the A posts and are joined to the rear parts by welding at a point opposite the roof panel and windshield panel joint.

Completion of the build-up of the underframe and body occurs with the addition of the sliding roof, the front and rear doors and the trunk lid.

Morris claims that repairs made necessary by accidents involve no more difficulty and expense with "mono-construction" than with separate chassis and body. A comprehensive manual issued for the guidance of repairmen describes and illustrates the build-up of the underframe and body, then gives exploded views on which the parts numbers are inscribed (as an aid in ordering parts), and then gives illustrated hints on the elimination of small irregularities. Another section is devoted to recommended welding methods. Bent side members, "pushed-in" rear end, and other deformations resulting from accidents can be corrected without replacements. This is supplemented by illustrated advice on the removal of small dents from panels, the shrinkage of buckles, patching by welding and the correction of stretched panels. Other sections are devoted to recommended welding methods, the breaking and remaking of spot, gas, lap and butt welds, torch soldering, replacement of damaged panels and underframe alignment. Finally, there is a section on welding in general.

With pages $10\frac{1}{2} \times 8\frac{1}{2}$ -in. on art paper with loose-leaf binding, the manual runs to over 100 pages and is believed to be unique in character and form.

Hydraulic Brake Booster

A DEVICE for use in hydraulic braking systems which permits of doubling the pressure between the brake shoes and drum for a given pedal pressure is being manufactured by Carroll B. Vickers Manufacturing Co. of Buffalo, N. Y. It is intended for use mainly on trucks, buses, and other heavy vehicles. The unit is secured to the frame and connects to the outlet from the master cylinder of the braking system by a tube. When the brake pedal is first depressed and the clearance between the brake shoes and drums is being taken up, the brake fluid moved by the master cylinder passes directly through the unit to the brake cyl-

inders, but after a certain pressure has been reached, the passage through the unit is shut off. The line pressure at which this change-over occurs can be varied by means of the adjusting cap shown at the bottom of the unit in the illustration. It is



Vickers booster for hydraulic brakes

usually held at somewhere between 300 and 500 lb. per sq. in. Thereafter the fluid put under pressure by the master cylinder acts against a plunger in the relay unit; this plunger is integral with another one of one-half its cross sectional area, moving in the right-hand cylindrical extension of the unit. The smaller plunger forces the fluid toward the brake cylinders, and as the force on both plungers is the same, the unit pressure is twice as great in the lines to the brake cylinders. An automatic pressure shut-off located on the unit over the connection from the master cylinder, protects the system against excessive pressures.

New Ford Press Shop

(Continued from page 467)

ments. All overhead steel work and air-conditioning ducts, roof and side walls are painted white, while the equipment is painted a dark "crane" blue, restful to the eye.

There are no hand hoists in the tool and die shop, all lifting being done by electric hoists, traveling hoists, and cranes. There are two 50-ton cranes, two 20-ton traveling cranes in the main bay and eight 10-ton traveling cranes in adjacent bays, with two 20-ton and three 10-ton transfer cranes and 69 electric hoists to be installed. The hook clearance of the 50-ton cranes is 31 ft. 6 in., and they have a span of 86 ft. 4½ in. The 10- and 20-ton cranes have a span of 39 ft. 8 in. Equipment of any size is handled with little difficulty on the plant's lifting system.

Heat and power installations enter the building from underground passages. Light and power switches, electrical outlets and telephone connections are in cabinets attached to the main building columns. The power lines are brought up through the floor.

Window Regulator

A SLIDING or crankless type of window regulator for use on cars, in truck cabs, on motor boats, etc., is being manufactured by Young Windows, Inc., New York. The downward force on the window due to gravity is counter-balanced by an upward force due to a spring, and the window can be adjusted by merely applying pressure to a grip secured to the window sill.

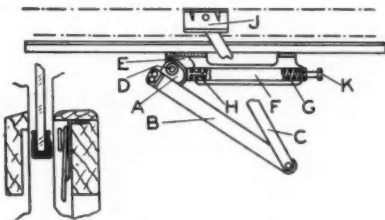


Diagram of the Young Window Regulator

Young constant-balance window fittings are made in two types, Types D and E, and the former are made in two sizes, D1, applicable to windows weighing from 6 to 10 lb. and D2, applicable to windows weighing from 6 to 12 lb.

The Type D balance assembly, which gives a constant balance in

all positions in which the window may be placed, eliminating the need for a locking device, is illustrated by the accompanying drawings. Cam A, to which the rocking arms B and C are secured, is adapted to rock on pin D supported by bracket E. Enclosed in tube F is a spring, G, which presses against the cam through the collet pin H. Bracket E is secured to the bottom of the glass channel of the window, while supporting plate J is secured to the garnish rail of the car by screws. The pressure of spring G can be adjusted to suit the weight of the

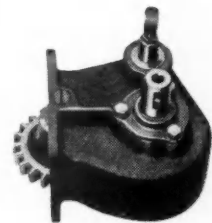
window by means of set screw K.

As the window is lowered, the cam slides on collet H, the cam profile being of such shape as to just compensate for the increase in spring pressure with compression of the spring and for the change in the effective lengths of the lever arms. Hence the lifting force due to the spring is constant regardless of the position of the glass.

Type E, referred to in the foregoing, is for heavier windows and comprises two cams and two sets of levers, pivoted at opposite ends of the tube containing the springs.

There is a Brown-Lipe Power Take-Off for every TRUCK APPLICATION

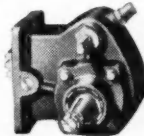
● The Brown-Lipe Power Take-Off line is quality engineered to stand up. Models for all truck types—for every application. Top mounted power take-offs are available for special uses.



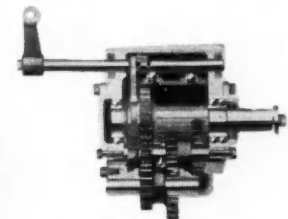
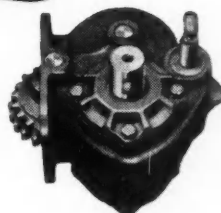
MODEL E
Offset—Single Speed—Two Gear



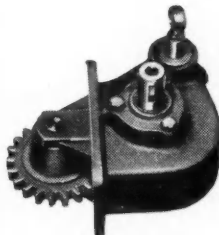
MODEL A
Single Speed—Single Gear



MODEL B & C
Single Speed
Two Gear

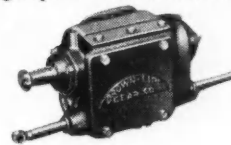


MODEL Y
Two Speeds Forward—One Reverse

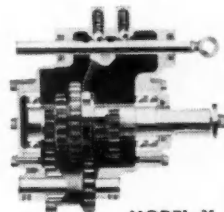


MODEL D
Deep Mounting
Single Speed—Two Gear

MODEL R
Single Speed Forward and Reverse



MODEL Z
Two Speeds Forward—One Reverse



MODEL X
Two Speeds Forward
One Reverse

Spicer

Spicer Manufacturing Corporation • Toledo, Ohio

BROWN-LIPE
CLUTCHES and
TRANSMISSIONS

SALISBURY
FRONT and REAR
AXLES

SPICER
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JOINTS

PARISH
FRAMES
READING, PA.

Passenger Car Models and Makes Under New German Regulation

	Up to 1200 cu. cm. (73 cu. in.)	Up to 2000 cu. cm. (122 cu. in.)	Up to 3000 cu. cm. (183 cu. in.)	Up to 4000 cu. cm. (244 cu. in.)	Over 4000 cu.
Adler.....	1	1	1		
Auto-Union*	2	1	1	1	2
B. M. W.....			1		
Daimler-Benz.....		1	1	1	2
Ford.....		1	1		
Hanomag.....		1	1		
Hansa.....			1		
Maybach.....			1	1	1
Opel.....	1	1	1	1	
Steyr.....	1		1		
Tatra.....			1		

* A combine of four plants producing cars under different names.

FIND OUT FOR YOURSELF WHY METAL MEN VOTED

Houghton, 2 to 1
IN CUTTING OIL
PREFERENCE!

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An all-inclusive series of straight cutting oils and bases, embodying the latest developments in sulfurized and E. P. treated products for every cutting need.

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THE HOUGHTON LINE
OF STRAIGHT AND SOLUBLE CUTTING OILS

German Car Limits

(Continued from page 451)

from 1½ to 3 tons load capacity will be turned out by six makers, including Borgward and Daimler-Benz, who will produce only diesel-engined 3-tonners, Ford and Opel, who will produce only carburetor-engined models, and Stoewer, which retired from the truck field long ago but is to reenter it with a diesel-engined 3-ton model. Decision as to what type of diesel engine is to be used by this firm and when its production is to begin has been reserved by the commissioner. One 3-ton truck model is to be built jointly by the Klöckner - Humboldt - Deutz - Magirus combine and Tatra, and the design and all details are to be settled jointly by the two concerns.

There will be three models of 4½ tons capacity. Büssing-NAG may continue its diesel-engined model unchanged, but Daimler-Benz and the Austrian works of Gräf & Stift will jointly produce a 4½-ton truck equipped with a Daimler-Benz diesel engine. These two firms have been merged already. The third model is to be produced jointly by Austro-Fiat, the Klöckner - Humboldt - Deutz - Magirus combine, MAN and Austrian Saurer. The last-named firm will be permitted, at least temporarily, to use its own diesel engine (built under license from the Swiss Saurer firm). Hanschel will be permitted to manufacture a 3-tonner with the understanding that it will associate itself as soon as possible with one of the three groups previously mentioned, which apparently means that the successful Lanova diesel engine is to be discarded.

Three models of 6½ tons capacity are to be produced, including two now in production, the Büssing-NAG and Vomag, while the third model will be produced jointly by Faun, Fross-Büssing (Austrian) and MAN. All three models will be equipped with diesel engines.

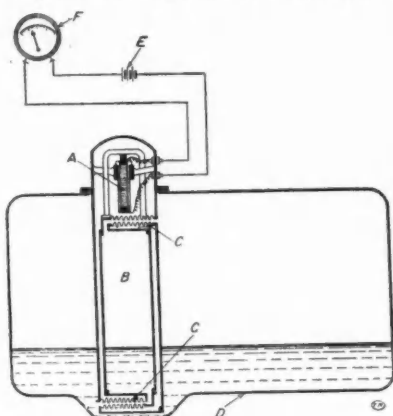
While, as mentioned in the writer's report on commercial vehicles at the Berlin show (AUTOMOTIVE INDUSTRIES issue of March 25), six-wheelers have practically disappeared from the German market, provision is made in the new program for the joint production of a six-wheeled chassis for motor buses by Büssing-NAG and Henschel.

Plants which have been engaged in the production of three-wheeled parcel carriers must in future turn out jointly a single three-wheeled design of 1430 lb. carrying capacity and 30.5 cu. in. engine displacement and a four-wheeler of the same engine size and carrying capacity. Trailers also have been standardized and in future only one model of each of the following capacities will be produced: 1½, 3, 5, 8 and 11 tons.

The models referred to in the foregoing are basic models, and manufacturers will be permitted to make minor modifications in them, but these also are subject to approval by the commissioner.

Abstracts

A fuel gage for aircraft that makes use of the principle of the carbon-disc resistor has been developed in France by Etablissements Rellumit. The general principle of the Rellumit gage consists in weighing a receptacle contained in the fuel tank and so arranged that the fuel level is the same in the receptacle as in the tank. The weight of the receptacle is sustained by the carbon pile, whose resistance varies with the force with which its discs are pressed together. The general arrangement is shown by the drawing reproduced herewith. The receptacle is located inside a closed metallic cylinder and communicates by means of flexible tubes with the air and the fuel in the tank. It is suspended by means of a yoke whose upper part rests on top of the carbon-disc pile. The carbon disc resistor is



Principle of the Rellumit fuel gage

A, stack of carbon discs; B, receptacle; C, C, flexible metallic tubes; D, fuel tank; E, constant-voltage source of current; F, ammeter.

connected in circuit with a constant-voltage source of current and with a galvanometer or ammeter. The latter therefore measures the resistance of the carbon-disc pile and, consequently, the amount of fuel in the tank. With the aid of an accessory device comprising a multiple-point switch and resistances, it is possible to gage the contents of a number of tanks by means of a single indicator.—*La Technique Moderne*, March 1.

Menasco Stock Approved

Listing of 100,000 additional shares of Menasco Manufacturing Co., builders of airplane engines, has been approved by the San Francisco Stock Exchange. Trading in the issue, it is said, will be called on receipt of SEC approval of the listing.

Tractor Exports Down in February

American exports of tractors and parts during February were 46 per cent smaller than a year ago, \$2,725,-

056 compared with \$5,050,049, the Commerce Department's Machinery Division reported. Wheel tractors showed the largest decrease, 65 per cent, to \$936,723 against \$2,675,886 in February, 1938.

California Aircraft Seek Tax Exemption

The California State Board of equalization this week sent to the senate and assembly a resolution urging the passage of legislation which would exempt from the California sales tax all mili-

tary and naval aircraft built for the United States Government.

The resolution was introduced by the board "to permit California concerns to compete on an equal basis with other airplane manufacturers."

Cited in the resolution are "the primary duties of the state in national defense," the tax free construction of certain types of vessels for the federal government in this state, and the fact the proposed exemption would effect no loss of revenue from the sales tax.

A measure is now in preparation which will carry out the board's recommendation.

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